



Baby, it's **COLD** outside...



Preparing our plants – and ourselves as gardeners – for what this spring may bring...



Scenes at South Coast Gardens in January 2014. Our cold frame storage unit partially buried under a 3m (9 ft) snow drift after Polar Vortex # 2 and our Edith Bogue southern magnolias (*Magnolia grandiflora* 'Edith Bogue') encrusted in snow.

At [South Coast Gardens](http://www.southcoastgardens.ca) (www.southcoastgardens.ca), anxious clients are beginning to ask what they can do about plants that are starting to show wear and tear from a winter known for its punishing pre-Christmas ice storm, record-breaking -40°C windchills and the bone-chilling cold associated with the Arctic weather phenomenon now popularly known as a 'Polar Vortex.' While some of the news headlines may seem more media hype than cold reality, temperatures over the past three months do, in fact, show this to be a below normal winter across the southern Great Lakes Region (and beyond).

With this in mind, I've prepared some reflections on the kind of winter it's been (to date) and to offer some insight and tips into ways to help recover plants damaged by the prolonged cold. To better understand what our garden plants are dealing with in comparison to some recent years, I examined the past 15 winters at two locations (Delhi, ON in Norfolk County and Toronto -North York, ON). Both of these Environment Canada weather stations showed very similar overall temperature patterns across the prior 15 year period. As

a result, we expect the year-to-year temperature comparisons presented below can, at a general level, be extrapolated to most garden locations across southern Ontario.

Should I be concerned about my garden given the winter we've been having so far?

From a plant's perspective, extreme low winter temperatures are a major determinant of its ability to survive in a given location. There are many other factors that play into the equation, such as how long a plant has been established (woody plants gain a bit of hardiness with maturity), conditions in the previous growing season (e.g. summer drought) that can affect its health going into winter, the degree to which new growth has 'hardened off' going into winter, siting, soil conditions, snow cover, etc. But annual low temperatures are a big part of the survival equation and a key reason they form the basis for many garden zone mapping schemes.

In southern Ontario, most locations can be considered a USDA (United States Department of Agriculture) zone 5, with areas closer to Great Lakes shorelines a solid USDA zone 6. It is not surprising then that many gardens will have a diversity of plants rated hardy to zone 5 and 6. In a winter like 2013-2014, however, these zone 5 and 6ers are the somewhat more tender plants we should be watching for signs of cold-induced stress. An established zone 5 plant should be able to take a few nights between -23 and -29°C . This should be pretty much a breeze in most of southern Ontario during an average year, and perhaps even this winter. A zone 6 plant should tolerate a couple of nights between -18 and -23°C . Not a problem in recent years. To be fair, though, while these plants are known to survive occasional low temperature dips within their tolerance range, it doesn't mean they are happy at these life-defining thresholds! Too many near death experiences in a winter and they might not recover at all...and that is why this winter's extended cold periods are raising concern.

The winter of 2013-14

At the time of writing (February 17, 2013), we are only about two-thirds of the way through the winter season (despite what some groundhogs have predicted). Even with a sizeable component of winter still to come, both the Delhi and North York weather stations have already logged more nights below -18°C (0°F) than the ENTIRE winter period during any of the last 15 years. To date, that amounts to 25 nights so far at Delhi and 17 nights in North York (on average, Delhi might expect only 7 or 8 such nights in a winter, even fewer in North York). In Delhi, 11 nights have already fallen below -21°C (-5°F) of which 7 went below -23°C (-10°F)! There are few instances over the past 15 winters with such extensive outbreaks of cold nights. Zone 6 plants growing in either location are likely a little stressed out right now!

In terms of extreme low temperatures, most cities in southern Ontario have recorded some of their coldest temperatures in several years. For example, the overnight lows on both February 11th and 17th were the coldest of the season in Delhi where the temperature rapidly tumbled to -28°C (-19°F) – approaching the lower limits for even some zone 5 plants. Other overnight lows (to date) at locations around southern Ontario are presented in the table below. Nowhere have the lowest temperatures remained above -20°C , even in normally milder places like downtown Toronto (buffered by the urban heat island effect) nor in lakeside stations in Niagara such as Vineland. To varying degrees, we all appear to be in this together!

Extreme low temperatures for winter 2013-2014 for selected locations in southern Ontario

LOCATION	LOWEST TEMPERATURE (°C) TO DATE FOR WINTER OF 2013-2014 (as of February 17, 2014)
Delhi	-28.2
Guelph	-30.1
Hamilton (Royal Botanical Gardens)	-24.2
Kitchener – Waterloo	-30.7
London Airport	-28.3
Oshawa	-26.3
Sarnia	-25.8
Toronto City Centre	-21.8
Toronto North York	-25.0
Toronto Pearson Airport	-23.8
Toronto Buttonville Airport	-25.3
Vineland Research Station	-21.0
Welland-Pelham	-27.7
Windsor	-25.2

Beyond the sheer number of cold nights, there are a few other notable factors that are worth considering from a plant's point of view. The past late summer and fall seasons were exceptionally cool and some woody plants may not have fully hardened off prior to the onset of cold temperatures. Many southern species growing at South Coast Gardens, for example, had their fall foliage frozen off in late October before they could change colour which suggests that many were not yet fully prepared for winter dormancy. This was especially notable among Crape Myrtles, Franklinia and Stewartia.

The winter started very early with intense cold arriving in late November when the first record-breaking -15°C ($+5^{\circ}\text{F}$) nighttime low was recorded. The ground froze early and quite deeply in many locations before a helpful blanket of snow provided some insulation. But with the ground frozen deeply, roots will no longer be able to re-supply moisture to above ground stems and leaves until the ground thaws in spring.

January saw a parade of “polar vortices.” At least three descended on the Great Lakes Region over the course of the month. They delivered a combination of low temperatures, very dry Arctic air and almost unprecedented high windchill values for the region. For some plants, especially broad-leaved evergreens (e.g. rhododendrons, southern magnolias, American hollies), these polar conditions will have contributed to severe dehydration of their evergreen foliar tissue, especially those growing in more exposed locations to the wind.

A silver lining



Springtime in the display beds at South Coast Gardens

The good news for gardeners is that while this year is definitely the coldest by many measures over the past 15 years, the relatively recent winters of 2008-09, 2004-05, 2003-04 and 2002-03 also produced some outbreaks of notable cold weather. Even as recently as the winter of 2010-11, gardens endured some chilly temperatures, albeit of a much briefer duration. For those with established garden plants that pre-date those years, plants that performed well through those earlier conditions will likely pull through once again this winter. Most Ontario native plants will shrug off this cold winter and our experience at South Coast Gardens demonstrates that even those introductions from more southern climes that we consider tender in our region have a remarkable ability to recover after a bout of cold, even if looking a little beaten up in the short term. Nonetheless, as winter transitions into spring, an important garden focus in the weeks ahead should be to assess the condition of your plants and, if necessary, take some simple steps (see below) to help protect those that may be vulnerable given the winter conditions they've endured. Focus on the more tender species and cultivars...generally those rated as hardy to USDA Zone 5 and 6 (or even 7 for the zone pushers!!) as well as any plants that are new additions and not yet fully established.

Tips to protect plants in late winter

Many of the more tender plants and those with southern origins often struggle more with late winter cold than early season low temperatures. They tend to break dormancy earlier and become more vulnerable to damage from late cold snaps. Hence, the need to consider protective action now. As the sun gets stronger, it can warm up cold plant tissue very quickly, damaging plant cells. This is especially true of young tree stems with smooth and/or thin bark as well as the foliage on broad-leaved evergreens. Also, although the sun may be warming the above ground parts of the plant, if the roots remain locked in frozen ground they simply can't supply the stems and evergreen foliage with water to replace what is being lost above. Under these conditions

plants can actually suffer drought stress if the root zone remains frozen into early spring. Keeping stems and foliage shaded in late winter and spring until the ground is FULLY thawed can make a significant difference in the amount of foliage retained or the amount of bark split observed on the stems of smooth-barked trees (e.g. magnolias, Japanese maples, lindens and young fruit trees). To check if the ground is fully thawed, try inserting a metal rod or thin stake into the ground to a depth of 30cm or more. Until the stake can be easily inserted without resistance from frozen ground, plant protective devices should remain in place.

Here are some additional tips to help dormant plants adjust to spring:

- If not done earlier in the season, now is the time to place a white plastic tree wrap on the trunk...this also affords great protection from damage by rabbits and rodents. Stems between 2 – 8 cm diameter (1-3 inches) are especially vulnerable to late-winter sun scald. The lower 2m or approximately 6 feet of the stem should be wrapped.
- For broad-leaved evergreens, placing a white fabric (a bed sheet or the product ‘Better than Burlap’) in a position to shade the plant from mid-morning to mid-afternoon sun will help reduce heat stress on the foliage until the ground is fully thawed in spring. Do not wrap the plant too tightly, it is sometimes better to create an upright screen to the east, south and west of the plant.



Southern Magnolias with tree wrap on stem and use of white sheets for sun protection on foliage

- For small specimens, inverted containers (e.g. large pots) can be placed ovetop sensitive plants, but this should be done carefully so as not to break branches. MAKE SURE to then cover the container with a white or otherwise reflective material, otherwise you can literally “cook” the plant inside a dark container on a sunny early spring day. Also, placing a brick on top helps prevent it from blowing away!



- Alleviating the crushing effect of snow and ice on shrubs. Slowly pour mild or tepid (never warm or hot) water to gently melt ice and snow that may be weighing down branches on days when the temperature is at least $+4^{\circ}\text{C}$. For practical reasons, this somewhat tedious procedure is best reserved for your highest valued specimens but it can be effective in helping to prevent branches trapped in ice and crusty snow from being pulled down and causing major stem breakage. DO NOT try to take a short cut and pull or tug branches out of the snow as this invariably will lead to more damage (I speak from personal experience!). Some severely bent stems (especially main leaders) can be staked in spring to enable proper growth form to recover.
- Oh DEER!



White-tailed Deer

With deepening snow and ice and prolonged cold, herbivores are getting very hungry as the winter drags on. Clients, even in urban areas, are reporting that deer browsing this year is becoming a serious problem. Evergreens of many varieties, rhododendrons, hydrangeas and viburnums are just a few of the species deer relish. A few leaves or twigs here or there is not a concern but once they locate a food source they can completely defoliate or browse back tasty plants in just a few nights. Intensive browsing can set plants back significantly. The only way to ensure protection of targeted plants is to completely wrap them in burlap or other coverings that prevent the deer from accessing them. There are countless creative options to reduce the impact of deer browse, but the only

foolproof long-term method we have found at South Coast Gardens is to place a barrier between the animal and the plant!

When spring does arrive, what steps should I take to assess damage and help plants recover?

- Broken branches. After the ice storm and heavy snows this winter, there may be broken or severely bent limbs that need pruning. Use the proper tool for the job (pruning saw or secateurs) to make a clean cut back to the closest main stem or branch. It is good practice to disinfect the blades between cutting different trees so as not to spread fungal diseases. This pruning can be done as soon as it is safe to manoeuvre in the garden without slipping on ice while holding a sharp implement! SAFETY FIRST!



- Brown foliage on broad-leaved evergreens. Despite what may look like considerable winter damage early in spring, don't take any drastic action. Patience is key. Broad-leaved evergreens may completely defoliate after a harsh winter but the woody tissue often survives and by early summer the plant may be in full leaf again. Some loss of Rhododendron flower buds may occur as these too can be more sensitive to cold temperatures than the wood. Once new foliage and shoots begin to emerge, dead areas will become more apparent and can be trimmed back at that time. Often, the bark on dead stems will look quite a bit more shriveled and desiccated than on wood that is re-budding. By the first week of June, if the plant remains lifeless then it has no doubt succumbed to the harshness of winter.
- Bark split. At South Coast Gardens, we generally allow plants to heal naturally. In some cases, wounds can gently be cleaned out in mid-summer as the dead bark and wood tends to soften by then and is easier to remove. By mid-summer, new wood should have begun to close the wound. Removing the dead wood reduces the chance for secondary infection.

Winter Bark Split



The wound on the right has properly healed after two seasons.

- Spring feeding. For winter-damaged plants, attention to good cultural practices will be key to enabling plants to better recover. While specific requirements for feeding and watering will vary depending on the species or cultivar, as a general rule ensure that the root zone is kept free of weedy competition, keep it evenly moist (mulching will help) and ensure that the plant is well (but NOT overly) fed. If stem die-back has been significant, providing an early season feeding with a little higher nitrogen (N) may help with new vegetative growth. As always, please seek professional advice and carefully read labels to ensure that applications are beneficial and appropriate for the plant in question.

Anticipated plant performance - a few specifics:

Bamboo: Many hardy bamboos (e.g. *Phyllostachys* spp.) have already been hard hit this winter and the canes may die to the ground come spring. Species of *Fargesia* will be the toughest survivors in terms of foliage and canes and even if defoliated, these should re-leaf on the canes in spring. Others may need to be cut back to the ground. No worries. In our experience, the roots will be hardy and new canes will rapidly develop by late May. At South Coast Gardens, new canes of *Phyllostachys aureosulcata* have grown more than 7m (20ft) tall in only two weeks in late May...making recovery of established plants seem almost instant!

Redbuds: Young redbuds (*Cercis canadensis*) will often suffer some dieback after a cold winter when temperatures fall below -23°C . After two or three years they toughen up and sail through such conditions. Varieties such as 'Forest Pansy' are more tender than the species and can suffer a little more after a harsh winter as will most varieties of Chinese Redbud (*Cercis chinensis* and *C. yunnanensis*). In all cases, our experience at South Coast Gardens is that these trees will recover rapidly as the season progresses. Do not trim back dead wood until new shoot growth emerges in spring after flowering has ended.



Cercis canadensis 'Appalachian Red' at South Coast Gardens

Eastern Flowering Dogwood (*Cornus florida*): These native Ontario trees are expected to be hardy with the possible exception of flower buds which are known to be susceptible to winter desiccation (but usually only after a really tough winter). Pink-flowered forms (*Cornus florida* forma *rubra*) are slightly less hardy than white flowered forms and may suffer minor dieback but will recover fully over the summer.



Eastern Flowering Dogwood 'Pink-flowered form'

London Plane trees (*Platanus x acerifolia*). These trees are notorious for developing large frost cracks, even on larger specimens. With warmer temperatures, they should close up again although evidence of the cracks will persist for many years.

Rhododendrons (*Rhododendron* spp.): The most vulnerable members of this group of plants will be some of the larger-leaved, evergreen forms. At South Coast Gardens we are beginning to see the effects of sun burn on exposed leaves already and with the ground solidly frozen we expect late winter dehydration could be a serious issue this year, especially for newly planted specimens (last 2-3 years). Blocking sunlight from hitting the foliage now would be good preventative medicine! Once spring has arrived, allow any browning foliage to

drop naturally (do not be tempted to pull it off as this may further damage stressed plants). In most cases the wood and buds will have survived and the plant will recover in due course.



Rhododendron x 'Blue Peter' in the display beds at South Coast Gardens

Crape Myrtles (*Lagerstroemia indica* hybrids and *L. fauriei* and Butterfly bushes (*Buddleia* cultivars). Both are likely to suffer significant stem dieback. They are late to bud in spring so again, patience will be key. By late May, examine stems carefully for budding. If nothing is apparent on the stems then prune back hard to the base. Given the good snow cover, most root systems should re-sprout vigorously by early summer with flowering occurring by late summer on the new shoots. Crape Myrtles are still experimental in southern Ontario and we are testing 19 cultivars here at South Coast Gardens. Over the past few years we've been impressed with how tough some are proving to be with some woody stems surviving -22°C (-7°F) last year (our coldest night). We will report back on how they responded to these chilly temps towards the end of spring.



Crape Myrtle 'Sioux' at South Coast Gardens

Wisteria: American species and cultivars (e.g. *Wisteria frutescens* ‘Amethyst Falls’) should thrive and flower. Asian species such as *Wisteria floribunda* and *W. sinensis* (the most commonly grown in Ontario) may have stem die-back and flowering is likely to be diminished based on the cold temps.

Southern Magnolias (*Magnolia grandiflora*): Expect complete or extensive foliar loss, but in our experience woody stems and buds will survive. Several of our southern magnolias at South Coast Gardens have recovered, even after complete defoliation. We grow these in Ontario at the very edge of their limits so we celebrate the good years and nurture our plants back to good health after the rough years! There is little doubt this will be the latter.



Southern Magnolia (*Magnolia grandiflora*) at South Coast Gardens

Sweetbay Magnolias (*Magnolia virginiana*): While the evergreen forms may look miserable right now with much of the foliage turned brown (as they do in our display gardens), the wood remains hardy to at least -26°C (-15°F) and each year we are impressed with their rapid and full recovery come spring here at South Coast Gardens.



Sweetbay Magnolia (*Magnolia virginiana*) at South Coast Gardens

American (*Ilex opaca*) and English Hollies (*Ilex aquifolium*): Depending on exposure to wind and late winter sun, some might completely defoliate this spring. Generally, the wood is tough and they should recover fully by early summer. More so for American than English Holly.

Looking forward to spring!



Rhododendron 'Choice Cream' in the display beds at South Coast Gardens.

While it is disappointing to see a cherished plant get set back after exposure to a cold winter, it also affords gardeners an opportunity to observe and document the degree to which plants recover from these harsh winter conditions. At South Coast Gardens, we expect that among the many plants we are experimenting with that there will be setbacks but there are also going to be some equally positive surprises. By early summer, we hope to post on our website (www.southcoastgardens.ca) a list of the biggest winners and, no doubt, a few of the biggest losers. We would appreciate hearing of your successes as well! With every season, we learn more about the plants we love!

So stay tuned. If you have specific questions or concerns about plants in your own garden, please e-mail Kevin at southcoast@kwic.com. Attaching a picture of the plant in question greatly helps in delivering advice. Please feel free to circulate this piece to other gardeners shivering through this winter who you think may find this helpful! Keep warm!

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Rhododendron 'Keowee Sunset'