Baby, it’s cold outside! While we huddle up to the fireplace or pay the oil delivery man for our comfort, trees and shrubs just stand out there and grin. How do water-filled woody plants survive freezing, especially when temperatures fall well south of zero? Let’s de-mystify this rather complex process.

Cold hardiness depends upon not just how cold the air turns, but also on rainfall, light intensity, day length, soil fertility, previous high temperatures, and the consistency of temperatures. The shrinking light and dropping temperatures which accompany autumn are the most crucial of these influences which naturally trigger plants to develop cold tolerance. The longer a plant is exposed to these changes, the hardier it gets. Scientists call this “acclimation,” while gardeners know it as “hardening off.” If frigid temperatures occur before proper acclimation, plant damage may result. For example, August’s English ivy plant may die if exposed to 25 degrees F, while it may withstand minus 30 degrees F in January after being properly hardened off. Similarly, a warm spell during a winter might cause a plant to de-acclimatize and later suffer if there is later cold snap – just another factor to keep us horticulturists awake at night.

Genetics also play a part. A native red maple (*Acer rubrum*) from Georgia will be less cold tolerant than the same species from New England, even if hardened off in the same way. That is why we often proclaim it is better to buy young woody plants from northern nurseries rather than from warmer climes. But of course every species, even when properly acclimated and of the hardiest known stock, has its rock bottom temperature it can tolerate. Witness the crepe myrtles in Charleston, SC but not Castleton-on-Hudson, NY.

Forgive me for wandering: my prose has evaded the original question better than a politician before Election Day. How exactly
do woody plants survive winter? Down to the microscopic level! Plants are composed of cells and the spaces in-between cells, known as intercellular spaces. If an un-acclimated plant is exposed to freezing temperatures, it will be injured because the water inside each cell freezes. The freezing water expands, the cell walls burst, and the cells die. Not good. The hardening off process stimulates the solutes (the stuff dissolved in the water inside the cell) to become more concentrated, or in other words, it encourages the cells to become less watery inside. These less watery/more concentrated cells don’t freeze as easily. It’s just like putting anti-freeze in your car’s radiator instead of water.

An interesting aside is that hardening off also makes the solutes in the in-between spaces less concentrated, or more watery. This might seem dangerous, but freezing water in these intercellular spaces does not normally cause plant damage. Yet even tough plants have their limits, and at some very cold temperature, the differences of more solutes-in-the-cell/less-solutes-outside-the-cell cannot be maintained. The cells then may indeed freeze and die. Let’s just hope it doesn’t get that cold this winter.

Yikes! What’s Happening Here?

I went far back into my slide files (remember film cameras?) for this month’s photo. While the image may be old, the root cause of the problem is timeless: some plants don’t like wet feet! By feet, of course, I mean roots. These white pine were planted in-between a very large building and a parking lot, and struggled along for years. The planting area was slightly lower than the parking lot, where I was standing to take the picture, so the surface water collected beneath the trees. And look at the building - a huge roof and no gutters. Rainfall cascaded off the roof and went right into the planting bed. Waterlogged soil contains little air, so in essence, flooded roots actually start to die not from too much water, but from a lack of oxygen. The situation could be solved by putting up some gutters on the building and re-directing the surface water, or choosing plants that don’t mind living in occasionally flooded soils, such as the winterberry holly (*Ilex verticellata*). - David Chinery
Winter is a time of rest for gardeners but it is not entirely without garden work. It may not be physical work but planning for next season’s garden requires some thought, research and time to commit ideas to paper.

As the seed catalogs roll in, it is hard not to be engaged if you are a gardener. On the covers are gorgeous pictures of perfect flowers, fruits or vegetables that seduce you quickly into the pages of descriptions and then it is all over as of course you want one of everything! But by the time you actually make an order or two, equilibrium has returned and you have had time to think about this year’s garden and what you would like to change. Here is where a journal is the perfect tool and timesaver because when you make entries as the season progresses, crafting a plan for the new season becomes so much easier. A garden journal is a yearly record of what works and what does not work for you either aesthetically or culturally in your garden. It is your personal record of new plants, different cultivars of vegetables, weather and temperature, and insects and diseases that were a problem. Keeping a journal is a way to learn more about your garden and it will enable you to get more out of the experience of gardening and the garden itself.

Cornell has always endorsed the idea of keeping a garden journal and now that we are living with a changing climate, record keeping should be a part of your gardening toolkit. So, where to start with garden journaling is fairly simple as any small notebook will work, but books designed as journals have an advantage. The Master Gardeners of Albany County have published a garden journal, *Dig In*, that is also a monthly garden guide that reminds the gardener what pests and diseases to look for and what tasks need to be done. There is ample room to record plant lists, observations, favorite nurseries, etc. It is a place to keep all your garden data and to learn from it. There is monthly gardening advice from local gardeners for local gardeners, pages of resources and planning space for whatever types of gardening that you enjoy. *Dig In!* is your best bet to start off the 2014 gardening season!

*Dig In!* is available at the Cornell Cooperative Extension office located at 24 Martin Road in Voorheesville, NY 12186, and at The Book House in Stuyvesant Plaza. For more information on the Master Gardener garden journal, call Sue Pezzolla at 765-3516 or email to sep37@cornell.edu.

Text by Sue Pezzolla and Photos by Chuck Schmitt
Making a garden journal

Text and photos by Jenny Hudman, CCE of Schenectady County Educator

Having a garden journal is a fun project to work on while waiting for the ground to thaw. I started mine last year and I have enjoyed working on it as my garden grows. Having everything written down is also handy for future reference. You can choose to separate your journal by tabs according to the year, month, or type of garden (herb, veggie, perennial, etc.)

Supplies needed:
* Scrap cardboard for covers (2 8 inch by 8 inch squares)
* Hole punch
* 2 metal rings 2 to 3 inches in diameter (found in the embroidery section of the craft store)
* Adhesive (double-sided tape works best)
* Cardstock
* Graph paper
* Pictures of your garden
* Transparencies (found in the office supply store)
* Embellishments: twigs, hemp rope, scrapbooking supplies, stickers, ink, stamps, etc.

Directions for cover:
* Cut 2 8 inch by 8 inch squares of cardboard. This will be your cover and back of your journal.
* Using the hole punch, punch 2 holes on the sides, large enough for the rings to fit.
* The size of rings determines how many pages you can add to your journal.
* To decorate, I added twigs to my cover by hand sewing hemp rope to the cardboard.
* Use stickers or embellishments to make a title.
* To make a pocket page for your seed packets and plant markers, lay a transparency page on top of a piece of cardstock. Then run both through a
Some pages you may want to include:

* Before and after pictures of your garden
* A page of any soil analysis you may have had done for your garden. Be sure to include what amendments and fertilizer you have added to the soil, and when.
* A garden layout page can be easily made on graph paper. Include a compass to show sun direction.
* A monthly calendar of when you started your seeds, when you planted, when they bloomed, when you weeded, and when you harvested your crop.
* Give each plant or crop its own page and include a picture, botanical and cultivar names, location in your garden and care needed
* A to-do list for your garden
* A plant wish list
* A list of seeds you saved or plan to save
* An address book of favorite resources (or websites) and your local Master Gardener hotline number

Most importantly, don’t forget to go back and record the end of the growing season results. Write down what plants did best in your garden, what type of vegetables were produced in over-abundance, what plants need to be moved, and the plants that need to be taken off your “to grow” for next year. Keep notes of problem plants and areas in your garden to fix for the following year. It also is important to include some notes about the weather of the growing season, including temperature and rainfall trends. Once you have recorded all the above information, you can then start planning your garden for the next year.

Garden journals can be as elaborate as a scrapbook or as simple as a notebook, but keeping a record is a great idea for every gardener. It is nice to reflect on your accomplished in your garden during the winter months. And having it all together in a journal makes it easy to share with others.

A great website to get you started, which has great printables for your journal, is:
http://www.homesteadgarden.com/journal.shtml

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**Your trees are sloughing off!**

Every fall as you are raking up the leaves from under your trees, did you ever think about what is going on right under your feet? Probably not. But, according to Steve Gabriel, Cornell educator, your tree’s roots are sloughing off. That means they are shedding about 25% of their root mass. Need a comparison? Think of a snake shedding skin. That’s what going on in the underground. The roots are shed, they rot and turn into organic matter and continue to nourish the tree. Pretty neat, huh?  - Don Maurer

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**Root Concerns**

**Volume 9, Number 1**

Page 5
Today, I really love our yard, our lawn, and our gardens: they’re buried in two feet of snow and all I can do is watch! Luckily there’s plenty of “winter” interest left — snow on the rose arbor, ornamental grasses shivering in the wind, the cold blue shadows cast by the Adirondack chairs I left out in the elements. Aside from that, the yard’s a thing of beauty.

Then I turn around.

Our home has morphed into an Eden full of seven dozen varieties of ferns, jade plants, orchids, passion flowers, African violets and a 6 foot ficus tree that has survived through the 34 years of our marriage. Let’s just say our collection of winter “house guests” is a diverse group and somewhat demanding. Furthermore, they are going to be long term tenants. I just realized that I brought them in October and they won’t be leaving till May! That’s seven months! It’s going to be a long winter.

And like any other house guest, each species arrives with their own care and feeding “requirements.” And light requirements. And temperature…. it goes on. Some of it’s easy. Like the daily refilling of the two humidifiers. It’s not on a par with cleaning the Aegean stables, but it must be done.

But the weekly hand watering takes time. It’s upstairs, downstairs, lugging a two gallon watering can to quench the thirst of 83 plants. Oh, it’s 84. I always forget the stag horn fern in the foyer. And every two weeks, they get a special treat - a shot of the blue stuff (the orchids have a special blend). After all, every plant needs it’s nourishment.

I never thought that there were micro-climates indoors, too. In fact, some we had to create. My love’s beloved orchids are feuding over the thermostat. Some, including the Cymbidium clan, like constancy and find that 70 F will do nicely, while others, such as the Dendrobium gang, are fans of variation. They thrive enjoying a 30 F shift in temp. How do we do it? The 13 individualists have conquered and claimed our guest bedroom. To meet their special needs we cut the heat and let the sun warm them by day and the moon cool them by night. And the plants thrive.

Aside from the basic life support functions that have to be tended to, there’s a few “nice to dos” too. Like the ferns could stand a trimming; the ficus tree could handle some pruning as well. Oh, the little jade plant starters need to be relocated. Has there been a bug check lately? Yes, the pests snuck in. But here is where the intimacy between plant and plant tender really shows up. Outside I would have blasted the buggers with high pressure spray; now the weapon is a cotton swab drenched in alcohol.

In many ways, winter gardening is just like outdoors. The more you look, the more you find to do.

With all the plants we brought inside, I do have a favorite group: the roots and tubers slumbering in their burlap beds in our garage and cellar. They need nothing; they ask for nothing but to sleep undisturbed. I love ’em.

But just like raising kids, at the end of the day when everyone has been watered, fed and TLC-ed you get some quiet time. So I think I’ll pour some coffee….and look out the window and then, just maybe, I’ll glance at the catalogs that came today.
Starting marigold and tomato seeds in paper cups on the classroom windowsill is a rite of springtime passage for most school kids, and some of us never outgrow it. Germinating seeds is the current buzz among the Master Gardeners, and techniques, timing and tricks are debated with all the seriousness of a polar expedition planning committee. Each has his/her methods, but the seeds place the same demands on us all: water, warmth, then light.

Where to start seeds is often the first challenge. Windowsills can accommodate only a modest effort, and they can be drafty to boot. Many gardeners rig up fluorescent shop lights, which offer good illumination and are cheap to buy and operate. When growing under lights became popular in the 1970’s, fluorescent tube selection was hotly contested, but nowadays gardeners are less fussy, and the plants do well regardless. Where to set up grow lights often involves family negotiations. The living room, the kitchen table, on top of the washing machine, and any number of other places may be best, and the good humor of the household’s non-gardeners is greatly appreciated.

While out of the way, basements may be too cool for much to germinate. One Master Gardener’s solution is a special closet, with shelves and lights, painted reflective white. With the door closed enough warmth is generated by the lights to make a nice seed-starting environment. Grow lights must be kept very close (mere fractions of an inch) from the tops of tiny seedlings to prevent them from stretching and becoming weak and worthless. Turning on a gentle fan jiggles the seedlings, strengthening them, and the air circulation also reduces disease potential.

Virtually everyone agrees that soil-less potting medium is worth the investment. A host of plant diseases are unleashed when garden soil is brought into a warm indoor environment, and soil which is well drained outside is usually poorly drained in a pot. Medium formulated for seed starting often contains finely ground peat moss and vermiculite, is lightweight, easy to work with, and contains no disease organisms.

Money can be saved on containers. Discarded items often do well: try using yogurt cups, fast food salad containers, and TV dinner trays. Drainage is key, however, so punch a few holes in the bottom. One Master Gardener swears by her soil blocker, a device which forms tight blocks of medium and eliminates the need for a container of any type. The blocks are placed side-by-side in a flat and, while care is needed in watering, the simplicity of this method is attractive.

For those with bigger budgets, all manner of special seed starting trays, flats, and cells are available. These can be re-used year to year if disinfected in a solution of 1 part bleach to 9 parts water for 15 to 20 minutes. Using dirty equipment can quickly lead to every seedling’s nightmare, a disease called damping off, which causes young plants to keel over, cut off at the knees, and die. And that is no way to start spring.

For a more in-depth discussion on starting seeds indoors, see: www.extension.umn.edu/garden/yard-garden/flowers/starting-seeds-indoors/
This month’s photos came from Rensselaer County Master Gardener Warren Weiss. He writes, “Photo 1 is market day at Le Havre, France. France has a long growing season and every day is market day somewhere. I never knew there were so many types of cheese and wine! Photos 2, 3, and 4 are from the Mushroom Museum in the Loire Valley of France. The museum is actually a real mushroom cave that produces and sells many varieties of mushrooms. The gentleman is the tour guide and tender of the spores, beds, and all other aspects of the growing process including the laboratory. This guy is sort of like the “phantom of the opera”: he lives and breathes mushrooms, and seldom leaves the dampness and darkness of the cave!!! Photos 5 and 6 are Chateau Villandry in the Loire Valley of France. The gardens, all immaculately planted and pruned by a staff of 100 gardeners, surround an elegant chateau and former home of some pre-revolution French aristocrats. The best views from the second floor of the chateau.

Photo 7 is the classic view of Monet’s lily pond garden. It’s so beautiful in a quiet, dignified way. Unforgettable.”
Is Spring blooming in your mailbox? Enjoy the blizzard of catalogs. Now’s the time to beat the “drearies” by dreaming and making your colorful selections early.

So, let your planning begin. Why not draw a map of your garden and figure out what will be going where...and when. And for veggie folks, don’t forget to rotate your crops. Then be sure to make a copy of the “master plan” and be sure to take notes to record what worked well...and what didn’t do so good.

Don’t forget to feed your house plants. You can sprinkle slow release fertilizer around the base of the plant or use a liquid form.

Move living Christmas trees back outside (if weather permits!). Put them in partial shade at first to harden them off, then move them into full sun in a week or two.

If a few, consecutive, warm days have caused your bulbs to nose out from under protective mulch, plan to thicken the mulch layer as soon as cold weather returns to prevent freezing by exposure.

Check perennials to see if any have been pushed out of the ground by alternate freezing and thawing weather. If so, push them back into the soil; otherwise the exposed roots will dry out and die. Replace mulch if it has blown away.

Sterilize your tools, pots, and anything you use around your plants. The magic formula is: one part household bleach to nine parts water. Soak for about 15 minutes, rise, and let dry.

Now is a good time to take advantage of off-season specials on garden tillers or attachments.

Repair and lubricate your garden tools with moving parts, such as hand pruners, and loppers.

Text by Don Maurer and photos by David Chinery
I often long for the good old days, but I am not sure about this old-fashioned winter. Variations on the snow/ice/rain theme and roller-coaster temperatures are keeping me mostly indoors. But rather than descent into a cable-TV stupor, I am thinking of seeds.

It is easy to daydream through garden catalogs and websites, totaling up a hefty bill, but what about cleaning out the seed box? Mine has seeds that date back to the Carter administration. Science tells us that some seeds remain viable (able to germinate) for less than one year, while others can retain life for centuries. Part of this relates to how the seeds were stored – factors such as temperature and moisture play a part here – but each species also has an inherent longevity.

Kew Gardens, one of England’s top botanical research institutions, has grown a healthy plant of *Leucospermum* from a seed over two hundred years old, found in a Dutch merchant’s wallet. Typical garden seeds, however, are usually not so hardy.

According to the Oregon State University, sweet corn seed lasts one year, pole and bush beans two years, and tomatoes three years. These are estimates based on no special care given to the seeds. Life can be extended if the seeds are placed in a sealed jar containing a desiccant material (such as dry rice or powdered milk), which is then stored in a cool basement or refrigerator. Fifty degrees at fifty percent humidity is the goal. It really isn’t too much to ask, but you can be sure the plants (just like babies and dogs) will become more demanding once they germinate.

If throwing out seed pains you, a viability test may be in order, assuming you have a few seeds to spare. Take ten seeds (or even better, twenty) and place them, evenly spaced, on a damp paper towel. Roll the towel up, place it in a sealed plastic bag and keep it in a warm place, such as the kitchen counter. Light isn’t a concern for most species, but the temperature should be in the 70’s. After two days, open up the package and check to see how many seeds germinated; a viable seed will produce either a root first, or a root and a shoot at the same time. Keep checking until day seven. Your number germinated will give you the percentage of total viability. Not very high tech, but it could save some cash if you find the seed remains garden-worthy. If you handle these little creatures carefully, and have the indoor means, you could even pot up the sprout-lets in anticipation of spring.

Although I’m not crazy about the government reading my email, I am happy that there is something called the Federal Seed Act. Among other things, this law says that seed must be marked with the packaging date. Checking for this date on any seed you pick up in a garden center or receive through the mail helps in a small, but important way, to have a successful garden.
Gardeners have long relied on the United States Department of Agriculture (USDA) plant hardiness zone map to make good decisions about which plants to use in their gardens. In light of all the information on warming trends, many gardeners are wondering if they are still in the same zone or has it been changed? The first map was created in 1960 by Henry T. Skinner, then the director of the U.S. National Arboretum in Washington, D.C. It was adjusted in 1965 and then revised in 1990 to reflect “changes in the weather” and to include Canada and Mexico. The USDA hardiness zone map divided the US into 11 zones with 0 being the coldest. A good comparison is a thermometer, the higher the number, the warmer the area. So parts of Florida and California which are tropical areas are zone 11. Hardiness is based on several factors and not just on how cold a winter gets; it is all of a region’s weather patterns including the total precipitation, wind, sun, summer heat and humidity as well as the winter snow cover. Weather is also affected by topography so large bodies of water help to moderate temperatures. Hardiness is also genetic and some plants are naturally more tolerant of colder temperatures and some cultivars of the same plant may be harder because they were selected from plants that exhibited tougher characteristics.

After only a modest amount of research into climate change, warming trends and hardiness zone changes, it was apparent that I had much in common with the Verizon man who repeatedly asks, “Can you hear me now?” There are a lot of mixed messages about climate change and therefore a lot of confusion. The scientists do not agree even about basic definition of terms or how to calculate the changes. Scientists at USDA state that there is a difference between “weather” changes which are happening now and “climate” changes which must be measured over a fifty year period. Many scientists disagree stating that “the definition of climate is data collected over two to three decades.” A period of time long enough to register change. So the debate goes on but where does that leave the gardener for planting information? The USDA released a revised zone hardiness map in 2012 that lists Albany as a Zone 5a. Other resources for hardiness zone information are the American Horticultural Society (AHS) and the National Arbor Day Foundation. The AHS issued a revised zone hardiness map in 2003 but it was rejected by the USDA due to format and only having fifteen years of temperature recordings as data. In 2006 the Arbor Day Foundation released a new zone hardiness map using the most recent fifteen years of data from the National Oceanic and Atmospheric Administration’s 5,000 National Climatic Data Center cooperative stations across the United States. This new map shows that many areas have become warmer since 1990 when the previous USDA map was issued. The Capital Region ranges in winter from minus ten degrees to minus twenty degrees. Many states have large areas that have shifted one full hardiness zone and some areas have warmed two full zones. Some parts of the Northeast have an increase of as much as eight degrees in winter temperatures. The press release for the new Arbor Day Foundation map states that “the map is consistent with the consensus of climate scientists that global warming is underway.” So a word to the wise would be to record dates and temperatures in your garden journal. Soon we may reliably plant peas on St. Patrick’s Day or even Valentine’s Day if warming trends continue!

Sources:
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Columbia News Service: Global Warming in your garden? Climate change is a lot closer than you think by James Willhite
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http://www.gardening.cornell.edu/warm_winter/index.html
http://www.planthardiness.ars.usda.gov

Text by Sue Pezzolla
Making Terrariums

A Hands-on workshop for Children 5 Years of Age and Over

February 18, 2014  1:00 pm - 2:30 pm

Inclement weather date:
February 19, 2014
1:00 - 2:30 pm

Each participating child will create his/her own terrarium with live plants to take home.

Join us to build a terrarium and learn how the components of these self-contained mini gardens work together to form an ecosystem.

Fees: $12 for materials.
(Payment is due with registration)
All necessary materials will be supplied.

For more information or to register, please contact Sue Pezzolla at 518-765-3516

P.O. Box 497, 24 Martin Road ● Voorheesville, NY 12186 ● 518-765-3500 ● FAX 518-765-2490
www.ccealbany.com

Cornell Cooperative Extension Albany County provides equal program and employment opportunities.
“The only limit to your garden is at the boundaries of your imagination.”

Thomas D. Church,
Landscape architect and author
of Gardens Are For People

Gardening Questions?
Call The Master Gardeners!

In Albany County: Call 765-3514 weekdays from 9:00 AM to 3:00 PM and ask to speak to a Master Gardener. You can also email your questions by visiting their website at www.ccealbany.com

In Schenectady County: Call 372-1622 Mondays and Thursdays from 9:00 AM to Noon, follow the prompt to speak to a Master Gardener and press #1. You can also email your questions by visiting their website at http://counties.cce.cornell.edu/schenectady/

In Rensselaer County: Call 272-4210 Tuesdays and Thursdays from 9:00 AM to Noon and ask to speak to a Master Gardener. You can also email your questions to Dhc3@cornell.edu

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Spring Garden Day’14

Saturday, March 1st, 2014
9:45 am to 3:30 pm
Tamarac/Brunswick High School
Troy, New York

A celebration of gardening in Rensselaer County and the Capital District!

- Choose classes from 10 different gardening subjects
- Classes taught by local horticultural professionals, Capital District Master Gardeners and Extension Educators
- Delicious lunch provided by the Rensselaer County Master Gardeners
- Shop for bargains at the used garden book and plant sale
- Pick-A-Prize Auction, with something for everyone
- Exciting door prizes
You may grow flouncy peonies, stately irises and dramatic daylilies, but have you ever paused for the closest of looks? Even the shyest of violets is a study in curvaceous forms, color nuances and pollination secrets.

Please join us at Spring Garden Day 2014, where Keynote Speaker Teri Dunn Chace will encourage us to view a world of beauty and intricacy in every blossom. Her lively essays accompany the stunning floral portraits created by photographer Robert Llewellyn in their new book, Seeing Flowers. From it we can learn the natural history of more than two-dozen plant families and discover the subtle complexities of petals, sepals, stamens and pistils, which both delights and informs.

Teri Dunn Chace is a writer and editor with more than 30 titles in publication, including How To Eradicate Invasive Plants and The Anxious Gardener’s Book of Answers. Raised in California and educated at the Hudson Valley’s Bard College, she now lives and gardens in Little Falls, New York. As part of this presentation, Teri will be selling and signing her books.

For more information visit our website: www.ccerensselaer.org or call 518-272-4210
Save the date

**Saturday, May 17, 2014**

9am – 1pm

Cornell Cooperative Extension

24 Martin Road

Voorheesville, NY

**Garden Education Day**

An opportunity to buy plants, learn new things about gardening, and visit the demonstration gardens!