



# Journal of The Ottawa Bonsai Society

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2001

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## *The President's message*

*By Art Phelan*

I hope you had a happy and restful Christmas and New Year season. I have three post teens, one 25 year old who acts 14, needless to say there is never a dull moment when he is home. Luckily the holidays come to an end and we all return to our old routines.

Did you make any New Year's resolution regarding your Bonsai? I have to admit that I resolved once again to spend more time thinking and planning the design of my trees, perhaps even sketching and making notes. Also committed to focusing my efforts on the best of my trees and controlling my urge to acquire more, when I am not properly looking after the ones I have. Any of this sound familiar?

On a personal note, I started a new job south of Ottawa and am planning on relocating to the seaway valley area in the spring. This has been my second term as President. We will be looking for a new President and other executive committee members. If you are interested or think someone else may be, please call me.

We have some great workshops lined up, hope to see you at the meetings, participating and acquiring new trees and new knowledge.



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## The Ottawa Bonsai Society Meeting

Next meeting/ Prochaine rencontre: **January 21, 2002**  
Time/ Heure: **7:00 pm**  
Location/ Endroit: **RCMP Building/  
Édifice de la GRC  
155 McArthur Road, Ottawa  
(at the Vanier Parkway)**

*Park behind the building, buzz the intercom at the front door to get in  
Sign in with the Commissionaire at the front desk*

### At this month meeting/ À la rencontre de ce mois-ci:

*Design Workshop — Complete the design and repot of the Mugo Pine trees.*

### Upcoming events

**February** - Workshop on Japanese maples (~\$20 for material)

**May 20** - Workshop lead by David Easterbrook

**June 15 & 16** - Annual Show and Annual General Meeting.

*At every meeting/ À chaque rencontre:*

- *The Show Table > Bring your tree(s); get a free ticket to the raffle/ Apporter votre/vos arbre(s); recevez un billet gratuit pour le tirage.*
- *The OBS Library/ La librairie de la SBO*
- *A unique opportunity to network with the OBS members and share ideas/ Une opportunité unique de rencontrer les membres de la SBO et d'échanger idées et conseils.*

## The OBS Web site/ Adresse Web

**\*\* New Web Address / Nouvelle adresse Web \*\***  
**<http://www.ottawabonsai.sytes.net:8080> OR**  
**<http://ottawabonsai.zapto.org>**

- People who would be interested to receive the Journal through e-mail instead of mail are welcome to ask and send a note to me at [Aylmer58@videotron.ca](mailto:Aylmer58@videotron.ca)
- Les personnes intéressées à recevoir le bulletin sous forme de e-mail sont bienvenues de le demander et de m'envoyer votre demande à [Aylmer58@videotron.ca](mailto:Aylmer58@videotron.ca)
- Suggestions on topics and subjects that you would like to see appearing and discussed in the Journal will also be welcome and well appreciated.
- Les suggestions sur des points précis et sujets que vous aimeriez voir traités et discutés à l'intérieur du journal sont encore une fois bienvenues et seront bien appréciés.

## *How to germinate seeds*

*By Brent Walston*

**F**or years I grew most of my plants from cuttings and bought my seedlings. I had the feeling that growing woody plants from seed would be a five- to ten-year learning project. I was right. After a few years of experimenting with seeds, I discovered a great book on seed germination. I owe a debt of gratitude to Norman Deno for teaching me just about everything I know about seeds. If you have one book on seeds, it should be this one: *Seed Germination Theory and Practice* by Norman C. Deno.

Deno explains the germination of seeds in terms a layman can understand. His theory is that fruit and seeds contain chemicals in their seed coats or embryos that inhibit germination. These chemicals, which he calls germination inhibitors, must be removed so the seeds can germinate. Deno refers to the process of removing these inhibitors as pretreatment. You can break down most germination inhibitors by applying special moisture and temperature pretreatments.

### ***Moisture and temperature pre-treatments***

Seed from different species and cultivars can exhibit different germination inhibitors. Some inhibitors are broken down under moist conditions at 70°F, others under moist conditions at 40°F. Seeds may, and often do, contain more than one inhibitor. The seed of most temperate woody species requires a moist 40°F pretreatment cycle followed by a moist 70°F cycle to break down the inhibitors. This process was formerly called stratification because the seed was stratified or layered between medium in a flat and kept cool. Given what we now know about the process, the better term is pretreatment. It is nature's way of protecting seed from germinating prematurely during a winter warm spell or while it is still too cold. The inhibitors in seeds must be broken down in a certain order: first the 40°F period, then the 70°F phase, or vice versa, depending on the species or cultivar. Seeds will not germinate until this happens. Some species require multiple cycles since there may be more than one 40°F or 70°F temperature inhibitor present. In such species, the inhibitors must be broken down one at a time. Thus, you must alternate cycles of three months of storage at 40°F followed by three months at 70°F until germination occurs.

Open sown *Acer campestre* (hedge maple) germinates early in the second spring, indicating the need for temperature storage cycles at 40°F, then 70°F, and again at 40°F. The first inhibitor in the hedge maple breaks down during the 40°F storage period, the next inhibitor breaks down during the 70°F period during the summer, and the last inhibitor breaks down during the second winter. (Since the seed germinates while it is stored at 40°F, there is probably no second 70°F inhibitor.)

Warm (70°F) and cold (40°F) moist pretreatments can take place in plastic bags. You can place the seed between paper towels or mix it with peat or vermiculite as the water reservoir or medium. The refrigerator is a good place for a cold pretreatment. When the seed finally germinates, remove it from the bag and sow one seed at a time, if possible. I prefer to wait until the seed's radicle emerges and then plant it in a plug tray or cell. Waiting this long eliminates the waste involved in planting seeds. You know that the seeds you planted are going to come up because they have already germinated! This method is good if you have only a few seeds of a rare and valuable species. However, if this is not practical, you can remove the seeds from the bag when they begin to germinate and sow them in flats. The cold and warm moist pretreatments duplicate what nature does. In other words, if you open sow a flat and keep it outdoors over the winter, it will get a natural 40°F moist pretreatment, followed by a natural 70°F moist pretreatment in the spring.

### ***Other germination inhibitors***

Desert and subtropical species often require light and fungal treatments. Many of the problems associated with the need for light and specific fungi can be overcome by treating the seed with gibberellic acid. The vast majority of temperate climate woody species that we use in bonsai have no inhibitors in this category.

The pulp of fruiting species often contains a germination inhibitor. Washing all traces of pulp from the seed will remove

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## *How to germinate seeds (continued)*

this inhibitor. Mechanically remove the pulp or let it ferment so that it easily falls away from the seed. Once the seed is clean, wash it every day for seven days to remove all traces of pulp and the inhibitor. Most of the chemicals involved are water soluble, but a few are oil-based, and the addition of a small amount of detergent will dissolve them. This procedure works well for dogwood, ginkgo, apple, and Prunus species.

### *Impermeable seed coats*

A few woody species have hard seed coats that will not allow water to pass through during the pretreatment process or let the embryo expand. If you collect the seed fresh and keep it moist, you have already solved the moisture problem. You can go ahead and pretreat the seeds, then nick the seed coat afterwards to allow the kernel to break out.

### *Experimenting with seed*

If you don't know what inhibitors are in your seed, use the following steps:

Step 1. Soak the seed and place it in a folded paper towel. Put the towel in a thin, plastic bag, such as Baggies, and fold the top over. Store the bag at 70F. If no 40F inhibitor is present in the fresh seed, most temperate woody species will begin to germinate right away. If nothing happens at the end of two weeks, follow Step 2.

Step 2. Put the seed in the refrigerator for three months, checking it each week for signs of germination. If at the end of three months the seeds have not germinated, assume that a 70F inhibitor is present, and follow Step 3.

Step 3. Store the seed at about 70F once more. For most woody seed, the inhibitor will break down quickly and the seed will sprout in a week or two. If it doesn't, keep the seed at 70F for three months. If germination still does not occur, assume that a second 40F inhibitor is present, and repeat Step 2.

Repeat steps 2 and 3 until germination occurs, or until the seed rots. If you have no information on your seed, run multiple experiments. Place one bag in the refrigerator, store another bag at 70F, etc.

### *Care notes*

The seed must stay moist internally throughout the pretreatment process. Woody seed can stay a lot drier on the outside than most people think if it is fresh seed or has been properly soaked. Keeping the environment in the plastic bag on the dry side will eliminate a lot of the fungal problems that can occur during long storage times. This is why I am so particular about getting fresh seed that has not been overly dried; it already has internal moisture.

To determine the proper moisture level of the seed, you must know the difference between moist and wet. If a film of moisture is on the seed or the plastic bag after preparation, the seed is wet, not moist. The paper towel or other medium should feel almost dry. If the towel starts to get stiff during the process, it is too dry. Add a few drops of water or spray a single spritz from a spray bottle. The folded paper towel keeps the small seed from getting lost. For larger woody seed, I use vermiculite exclusively since it doesn't support fungal growth like paper does. I put an equal volume of vermiculite and soaked, wet seed in a plastic bag, then add water with a spray bottle, shaking the bag after each spritz. When I can detect the moisture with my fingers, the level is right.

For Cedrus seed, which does not take long to pretreat, I don't use paper towels or any other media. I soak the seed and dry it in the sun for about fifteen minutes until the outer husk feels dry to the touch. Next, I place the seeds in a Baggie, and put them in the refrigerator. Cedrus seed is very fleshy and retains adequate water for the month that it takes to germinate. Cedrus is also very sensitive to excess water and will rot in an instant.

If your seed is moldy but the seed coat has not yet cracked, wash the seed with a 10% bleach solution (nine parts water to one part household bleach). Let the seed dry, then return it to storage in a fresh bag, this time using a new paper towel or medium. Deno points out that sound seed has natural antibodies for most fungi. Still, keeping seed too wet is risky. Take

## *How to germinate seeds (continued)*

precautions to avoid fungus; once a pathogen is present, it will stay with your seed for life.

### ***Seed viability***

Obtaining viable seed is absolutely essential. You can run a few simple tests to check for viability.

### ***Float test***

The float test is the most common. Soak the seed in warm water for 24 hours. The seed that is not viable will float on the surface.

### ***Cut test***

If you aren't sure about your seed's viability, you can also try cutting a test sample. Open some of the seed and examine the kernel. Often the seed will be hollow, particularly with the Acer species. If there is no kernel or embryo inside the seed, there is nothing to germinate. The cut test can be performed in the field before collecting or soaking the seed. The hornbeam (*Carpinus*) and beech (*Fagus*) species are often hollow. If you open 10 to 20 seeds and find no kernels, you are wasting your time. Be careful since not all seed kernels are obvious; Amur maple (*Acer ginnala*) and hedge maple (*Acer campestre*) have very flat seeds.

### ***Fresh Seed***

I can't overemphasize how important it is to get fresh or properly stored seed. A lot of seed arrives from the supplier DOA, (dead on arrival), simply because it has been dried. The most notorious example is Red maple (*Acer rubrum*), which cannot be stored. This fresh, moist seed must be collected from the trees in the spring and sown immediately. The seed germinates in about ten days at temperatures of around 70F without any other pretreatment.

I spent hundreds of dollars on Japanese maple seed (*Acer palmatum*). Not a single seed germinated until I finally got smart and started collecting my own in October and November. The best seed will have some color to the wings and a bit of moisture in the fleshy part. If you collect the seed at this stage and refrigerate it without further drying, it will keep for some time. Most companies don't bother doing this; they desiccate Japanese maple seed like everything else. Another potential problem with Japanese maple seed is the tannic acid, which may act as an inhibitor. To make sure the seed will germinate, I soak and rinse the fresh seed daily for three or four days to remove most of the acid.

Other problem seeds are the hornbeam (*Carpinus*) and beech (*Fagus*) species. You must cold pretreat the fresh seed of these species and not allow it to dry out. I used to think that excessive drying put the seed into a state of deep dormancy. Now I think it either kills the seed, as in the case of Red maple, or dries and hardens the seed coat. The seed coat becomes semi-impermeable and prevents water from getting to the embryo. Unless you can get moisture inside the seed, the pretreatment processes cannot begin. If the seed has suffered excessive drying, you must keep the seed moist for six months or more just to get things started.

This should get you started germinating. Creating bonsai from seed is a long-term process, so don't let growing from seed be your only strategy. But it can be a rewarding learning experience in your overall plan to grow bonsai.

### ***ABOUT THE AUTHOR***

*Brent Walston and Susie Meier are the owners and operators of Evergreen Gardenworks Nursery. Brent does all the propagation and growing for the nursery. He has been practicing bonsai for 17 years. Brent has a B.S. in Education from the University of Maryland and is completely self-taught in the field of ornamental horticulture. He teaches occasionally at Mendocino Community College. Brent is active in the Internet Bonsai Club and may be reached at [bonsai@pacific.net](mailto:bonsai@pacific.net). He has created his own website for the nursery at: <http://www.EvergreenGardenworks.com>*

