

Wintering bonsai in the Ottawa area

Five broad categories based on temperature requirements and dormancy requirement:

Category	Dormancy type	Nighttime temperature	Daytime temperature	Species
Tropical	none required	Min 15C	Max 25C	Fukien Tea, Ficus, Sageretia
Sub tropical	slight cool down	Min 10C	Max 18C	Serissa, Fuchsia, Bougainvillea
Temperate	Cool down required	Min +2C	Max 10C	Azalea, Pyracantha, European Olive, Chinese Elm
Semi hardy	Dormancy required	Min -5 C	Max +4C	Japanese maple, Korean Hornbeam, Japanese Black Pine, Chinese Elm, Trident maple (-2C to +2C)
Hardy	Dormancy required	Min -10C	Max +2C	Larch, Cedars, Jack Pines, Cotoneaster, Amur maple, Austrian black pine, Mughho pine, Junipers

- Many species can adapt to condition of a warmer category. For example, we tend to mix our tropical and sub tropical into a single category.
- The important factor in mixing categories is to respect the lowest common denominator in the temperature range. For example, a Fukien tea will suffer if minimum nighttime temperature goes below 15 C which mean if you have a Serissa and a Fukien tea, you need to respect the lower range of the Fukien tea.
- The cool down period required for the temperate category can be extended in a cold room (with or without light) and become a dormancy period.
- The dormancy temperature required for semi hardy and hardy native trees does not need to below +2C which mean that you could use a cold room (with or without light) kept at +2 C for a combination of trees from the temperate, semi hardy and hardy category (i.e. Azalea, a Japanese Maple and a Cedar)
- There is no photosynthesis process during a dormancy period which means that no light is required
- A dormant tree still needs to be watered but less frequently.

Tropical and sub tropical trees

Light condition

- the most challenging aspect of keeping healthy bonsai inside
- the trees will likely lose vigor indoors which is normal in our climate
- needs as much light as can possibly provide
- window location (south, east and west) and distance from window (between 6 and 18 inches)
- artificial light
 - o will add valuable hours of missing light (keep lighting system on for 14-16 hours/day)
 - o needs to have broad spectrum which includes a lot of blue (for leaf development) and less of the red (for flowers development)
 - o Metal Halide lighting system as nice blue spectrum and is best for many trees
 - o High Pressure Sodium lighting system are more suited for flowering and not so much for bonsai
 - o Fluorescent lighting system can be used if combined by broad spectrum

Temperature

- adjust to match lowest common denominator of the group of trees

Humidity

- one of the indoor challenges
- trees love to have high humidity (50-80%)
- houses in winter are often between 30 and 40% humidity
- can be improved by using a humidifier

Air circulation

- trees love to have air circulation around them
- can be improved by small fan

Watering

- will require less frequent watering than outdoors in summer
- will vary depending on room temperature and humidity
- will likely vary between 2 to 4 days between watering

Insect

- another indoor challenge
- insects will develop more indoors since there are no natural predators
- might need to treat with insecticide during winter
- best practice is to treat tree with insecticide 3 weeks in a row before bringing tree indoors

Special note: baseboard heater

- a tree just above a baseboard heater will dry much faster and foliage could burn

Temperate trees

Light condition

- no lights required if kept in cold dark room in dormancy mode
- most temperate trees can stay dormant in cold room until spring
- if not kept in dormancy mode, then same lighting condition as mentioned in tropical category
- if tree is brought out of dormancy during winter, then a gradual adaptation to light is required

Temperature

- this category of tree loves to have a cool down period where the temperature varies between +2C and +10
- if kept in a cold room, the temperature can be between +2C and +5C
- it is preferable to avoid bringing the tree directly from the cooler outside condition to indoor warm condition. It is best to place the tree in a room where the temperature can be kept below 15C

Humidity

- not applicable if kept in cold room dormant
- same challenge as tropical if tree if tree is kept active

Air circulation

- not applicable if kept in cold room dormant
- same challenge as tropical if tree if tree is kept active

Watering

- every 2nd or third week if kept dormant in cold dark room
- will vary between 2 and 4 days depending on room temperature and humidity if tree is kept active

Insect

- less of a problem is kept in a cold room
- same challenge as tropical if kept active

Special note: baseboard heater

- avoid such a location for this category

Semi hardy trees

Light condition

- no light required in dormancy period
- will require a re-adaptation to sunlight period in the spring (either natural or simulated)

Temperature

- cannot support our winter
- need serious protection that will keep temperature between -5C and +3C
- best kept in cold room

Protection methods

- Pot in the ground
 - o the tree will likely die
- Window well
 - o the leakage of heat will provide potentially adequate condition for root temperature
 - o the hole should not be covered to allow snow to accumulate and water to reach
 - o extra soil insulation will be required
 - o potential location but very risky
- Shed
 - o the tree will die unless shed is insulated and heated
- Garage
 - o The temperature needs to be controlled (i.e. heated garage) or tree will die
- Apartment balcony
 - o Tree will die if no protection
 - o Needs to have a insulated box with thermostat and source of heat
- Cold dark room :
 - o excellent as long as temperature is between -2C and +2C (use range that will suit the lowest common denominator (i.e. be careful with Trident maple))
 - o provide extra flexibility for root development and repot if temperature kept at +2C
- Cold green house
 - o excellent as long as temperature is between -2C and +2C
 - o can the temperature be maintained during sunny days?
 - o provide extra flexibility for root development and repot if temperature kept at +2C
- On outside table

- the tree will die...

Humidity: not applicable

Air circulation: not applicable

Watering

- dormant tree still need to be watered to keep some moisture for health of root
- frequency of watering is much less then during growing season (i.e. every 2-3 weeks)

Insect

- insects are not a likely problem in winter but
- in protected are like cold room some insect could still reproduce (i.e. scale)
- application of dormant oil is recommended if tree as insect or as precaution

Hardy trees

Light condition

- no light required in dormancy period
- will require a re-adaptation to sunlight period in the spring (either natural or simulated)

Temperature

- can support our harsh winter condition as long as roots are protected and stay at above -10C
- will do very well in cold room that stays around +2C

Protection methods

- pot in the ground
 - in sun protected area to avoid potential mid winter unfreezing of soil
 - best location is in a shady area close to the foundation of a house
 - must be in good quality pot that won't break
- in window well
 - the leakage of heat will provide nice condition for root temperature
 - the hole should not be covered to allow snow to accumulate and water to reach
- Shed
 - temperature will fluctuate as much as outside temperature which not good
 - needs to be insulated and heated to keep temperature stable
- Garage
 - The temperature needs to be controlled (i.e. heated garage)
 - An unheated garage is not a good solution since it can become too cold
- Apartment balcony

- Tree will die if no protection
- Needs to have a insulated box with thermostat and source of heat
- Cold dark room :
 - excellent as long as temperature is between -5C and +2C
 - provide extra flexibility for root development and repot if temperature kept at +2C
- Cold green house
 - excellent as long as temperature is between -5C and +2C
 - can the temperature be maintained during sunny days?
 - provide extra flexibility for root development and repot if temperature kept at +2C
- On outside table
 - the tree will die...

Humidity: not applicable

Air circulation: not applicable

Watering

- dormant tree still need to be watered to keep some moisture for health of root
- frequency of watering is much less then during growing season

Insect

- insects are not a likely problem in winter but
- in protected are like cold room some insect could still reproduce (i.e. scale)
- trees kept outdoor could serve as food to small animal (mice, rabbit)
- application of dormant oil is recommended if tree as insect or for precaution

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