

A CURE FOR THE COMMON COLD

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Keywords: cultivation: bog-garden, Kansas (USA).

Since bog-gardens are not as common as terrarium plants, there is not that much information about how to build and operate them. There is even less information on the cold hardiness of carnivorous plants. Conflicting tales of cold-hardiness abound. I have heard many stories of plants surviving ice age-like conditions, but I have also heard about very light frosts that killed plants instantly. Inundated with confusing stories, I decided to see for myself. Since I was running out of room on my patio for my carnivorous plants and I live in a temperate climate, an outdoor bog-garden seemed like a good idea. So during the spring of 1999, I planted a bog garden. About 30 cm (1 foot) deep, it is not sunken into the ground, but is more like a raised-bed planting.

This is an uncommon way of growing plants (I am probably the first to try this in Kansas' climate!), so I thought I should write about my experiences. I hope they will benefit anyone wishing to own a bog in a temperate to cold temperate climate. Believe me, bog-gardens are simply the best way to show off temperate carnivorous plants.

Temperature preferences are a hotly debated topic. One minute you hear about flytraps dying from a light frost. The next you hear about bog gardens freezing into a block of ice, but all the plants surviving (In *The Savage Garden*, read the section on the cold hardiness of carnivorous plants.) If you want to set up the best bog to impress your pals, but do not want to risk your precious collection, which story should you believe? Believe it or not, stick to the story about the block of ice. Sounds like something you might regret? Wrong! You are reading an article by someone that has done it.

There are many factors that contribute to cold weather survival. The first is the cold-hardiness of the species itself. Trumpets often survive the cold better than flytraps do. Most fork leaf sundews (*D. binata* varieties) will not survive unharmed below -9°C (15°F), but that does not mean you cannot grow them in your bog if it does drop lower than that from time to time. While most of your fork leaf sundews may die in the cold, some plants may regenerate from the roots.

Another factor is the length of the growing period. If you are dealing with hardy plants the harshness of the winter may not be the most important factor determining winter survival rate. The length of the growing season helps determine whether the hardy plants have stored enough nutrients or not. Incidentally, if you have bought a carnivore out of season at a novelty shop, it will probably not survive as it will suffer too much shock. I bought a *Dionaea* 'Dentate Traps' during the winter, but which had summer leaves, and planted it in my frozen bog. It did not survive the winter.

Bog depth is also important. My plants survived in a bog that was above ground, and it was only 30 cm (12 inches) deep. But a safer option is to dig it into the ground some, as it protects plants even further. Bogs that are deeper also store more water, and they give plants more root space. Unlike exposed pots, deep bog-gardens can insulate the roots of the plants. The plants tolerate freezes better if their roots do not freeze.

Genetics are important. Venus Flytraps have an incredibly varied gene pool. Some clones may just be better at surviving the cold than others. For example, one of my plants which occasionally produces more than one trap per leaf also happens to survive the winter the best. It is extremely vigorous, produces many offshoots, and is the only one that stays mostly green all winter, despite the root and soil-freezing conditions which can last for several weeks at a time. In the spring, none of its leaves from the previous year blackened. This plant may lead to the creation of a new culti-



var that might be better suited for bog gardens. In any event, it is clear that some plants are just more cold-hardy than others.

Plant age is important. Seedling plants should have heavy protection, and should be spared from deep freezes. I lost seedling *S. leucophylla* plants in winter conditions that my mature plants survived. Meanwhile, my minute flytraps survived (just to be dug up and lost by an inquisitive squirrel—a pox on gray squirrels!).

Finally, protection is critical. You must always cover the bog with about 15-30 cm (6-12 inches) of straw if you live in a place like I do. (Even better, use a tarp, too.) Although heavily mulched, chances are, the top 5-13 cm (2-5 inches) of bog soil may still freeze.

I have not grown any bladderworts or butterworts outdoors, so I still have much more experimentation. But from what I have learned, flytraps and trumpets seem to tolerate deep freezes very well if properly protected. In fact, the most common cause of plant death in my bog-garden this year was from an August heat wave, when temperatures were above 38°C (100°F) for several days.

It is amazing you can grow carnivorous plants in conditions where the soil freezes deep enough to freeze the roots. Anyone wanting to grow a bog that is living in a temperate zone—all the best of luck! It can be done! Just make sure you can keep your plants alive before you attempt any freeze blasting!

Below are a few samples from my horticultural journal, so you can see some of my observations and experiences for yourself.

Fri., Nov. 5, 1999—Unpleasant times—the temperatures dropped below freezing on Tuesday, November 2nd. I was confident that the plants would be OK so I risked leaving the tarp off this time to see what would happen. I checked to see on Wednesday, and ever since, to see how they have been. The flytraps had ice that formed around them. The water in the *Sarracenia purpurea* subsp. *venosa* was frozen solid. I was a little surprised though. None of the *S. purpurea* leaves (except for a newly emerged one) were damaged from the ice. The tall *Sarracenia*—*S. leucophylla*, *S. flava*, *S. 'Judith Hindle'*, *S. rubra* subsp. *rubra*, and *S. oreophila*, and my *S. psittacina* × *leucophylla*—were not affected at all. None of these plants had damaged or flimsy leaves; they were almost totally unaffec-

ed. The flytraps had their leaves a little mutilated, they became soft and some of the leaves died. The very small, baby flytrap that was completely covered by ice looks ok. The temperatures at night have been 2-7°C (35-45°F).

Friday, Christmas Eve, December 24th, 1999: Harsher times—Merry Christmas! And what a surprise! It has been a few weeks below freezing. It has dropped below -1°C (30°F) during the day, and much colder at night. Unfortunately, no snow for Christmas. Despite the layer of straw, the garden still freezes on the top layer of soil. It may stay frozen for days. That worried me. I checked it out today to see if the plants are still alive. Amazingly, they still had green leaves under the soil. They have not wilted like the other leaves on top of the soil (the flytraps). I believe they are still alive. The water in the *S. purpurea* is frozen, but the foliage has not blackened or wilted! (I later discovered these plants did survive this freeze!)

Late November, 2000— Since the soil was not wet enough, I moved the flytraps, *D. filiformis* 'California Sunset' and *D. binata* var. *dichotoma* (a small red form) into pots, watered them, and then buried the pots in the middle of the bog-garden, where it would be warmest. I also covered them up with a little wet soil, as winter ice would add further insulation. I mulched the garden in late November with a 30 cm (12 inch) layer of straw. I placed old logs around to anchor a tarp over the bog. Then I left it alone for the winter.

December, 2000—temperatures were below freezing all month, with lows for some days around the single digits and the teens, and wind chills far below -18°C (0°F). We also had over 15 cm (6 inches) of snow, which stayed on the ground all month without melting. School was also canceled for three days because of the snow! But it certainly was beautiful. But how were the plants? I was pretty sure they were all right, because they survived almost unharmed last winter. But this year was harsher.

Feb. 19th, 2001- Today I went out to check my bog garden. The *S. purpurea* subsp. *venosa* plants had frozen water in them, and the soil was frozen 5-10 cm (2-4 inches) down. Some leaves were brittle, but those below the mulch were still in fairly good condition. The other *Sarracenia* all had some greenery underneath the mulch despite the layer of frozen soil, but everything above was brown. Then, I examined the flytraps. The leaves that were above the frozen soil blackened. But overall, the rest of the plants were still green and were doing just fine. I couldn't really identify the winter bud of the *D. filiformis* 'California Sunset' under the frozen soil covering it, but it is probably just fine. I am not so sure about the *D. binata*. The temperatures had dropped below -9°C (15°F), and I have not found any green, even at the crown. The plant may have died. I moved the pot to in my warm house to spark any growth.

—Freezing is definitely not the only winter problem in a temperate climate; heavy precipitation and frequent freeze-thaw cycles in the cold season may lead to root rot and massive losses. Growers in temperate zones are encouraged to experiment with the treatment of plants during the winter, but caution should be exercised, especially with prized plants!—BMR.