Growing 20,000 *Sarracenia* seedlings

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Introduction

The goal of this paper is to demonstrate the ideal conditions necessary for cultivating large quantities of *Sarracenia* plants, and how Richard Wuydts, Production Manager at World's Rare Plants, through a number experiments over the course of several years, successfully and consistently grows 98 out of 100 viable seeds by manipulating the environment.

Sarracenia is a genus of carnivorous plants native to the south-eastern United States and Canada, commonly known for their "trumpet like" appearance. Using a series of biological mechanisms to catch their prey, this genus does not have any moving parts. Combining the color, scent, and extra floral nectaries and the upper lip of the "funnel" the plant attracts insects that fall inside and are digested by various enzymes.

While *Sarracenia* are considered relatively easy to grow given the right conditions, typical cultivation methods show a yield for this genus is 3 seeds will germinate out of 100. This plant requires moist-wet soil consistently, sunny conditions during growth with decreased light and temperatures during a dormant period.

Setup

To create the environment for these plants, Richard first took two 1.2 × 4.9 m nursery tables and elevated them using 12 cinder blocks, 6 on both sides of the table. The tables are edged by 5 × 5 cm wood blocks, and covered in 6 mil double ply plastic. Drains were installed to prevent seedlings from drowning, and with water falling onto the floor, it would increase the environment's humidity.

Richard then built Quonset huts or Hoop house to enclose the seedlings using schedule 40 PVC pipe, attaching them to the outer edges of the tables, and covering them with 6 mil single layer plastic. Proper enclosure is necessary in creating the ideal environment and temperature that the *Sarracenia* require.

Temperature control

The seed of *Sarracenia* require variable temperatures and controlling the temperature within the Quonset hut is imperative for maximum yield. Richard developed a customized heating system that automatically monitors and turns on the heaters to control the Quonset hut's distribution of heat.

By installing waterproof electrical outlets, Richard was able to install a heater that is 4.9 m long and 1.2 m wide across both tables. The heaters were closely monitored through the use of a temperature controller and probe in one of the seedling trays to evaluate soil temperature.

The *Sarracenia* seed require variable temperatures depending upon the thickness of the seed coating. To make sure that the *Sarracenia* seed were heated properly at any given time, Richard implemented an automatic shut off and re-start system when temperatures rose or fell. This allowed for a consistent heat of the soil at 22°C.

A fan was then installed centrally toward the top to control the temperature further, as well as eliminate stale air and fungus growth within the Quonset hut.

Water distribution

To generate the most effective end result, controlling the amount of water, time of distribution, and method of distribution is important.

Just as he developed a custom heating mechanism, Richard created a customized method of water distribution. Mist systems were attached to both tables that delivered light droplets to simulate a cloud like fog, which captures the ambient heat and rains on the seedlings.

Richard then installed a timer for the mist system that controlled the distribution of water. Delivery was set at 2 seconds per hour, from sunrise to sunset.

Humidity and environment

By controlling these two elements, Richard was able to create a consistent ambient temperature of 31°C , a water temperature of 26.7°C, and humidity above 80%. The heat and water distribution methods combine to create a unique atmosphere within the Quonset hut that is highly conducive to successful *Sarracenia* propagation.

Preparation of soil and seedlings

After the Quonset huts were prepared and optimized, Richard focused his attention on the final two important variables.

Using 28 × 61 cm plastic trays with holes in them, Richard added his seedling mix, which consisted of sifting peat moss, and two different types of kiln dried sand. This mix allowed Richard to move the plants without roots adhering to the soil in the next stage of planting, which he calls "dibbling."

A layer of 38 mm of soil mix is placed in the tray. The medium is wet down, and the seeds are laid on top of the soil with a light dusting of the soil mix on top. Finally, the trays are placed on top of the heaters.

Seedling growth

Not all seeds are the same.

The majority of seedlings sprouted in the Quonset hut in soil temperatures of 22°C. The seeds that did not open were removed and placed in a similar set up, in a cooler area, to germinate in a more suitable environment.

Depending on the temperature at the time of pollination, the seed coatings will differentiate in thickness – so one tray of seedlings can last for the whole propagating season with different crops coming up at any given interval, depending on germination temperature.

Conclusion

Richard's expertise of carnivorous plants and manipulation of the environment generated a huge increase in germination for this particular genus of plant, and he has perfected a repeatable method

of growth. What once was 3 out of 100 seeds germinating now becomes 98 out of 100 seeds germinating with this method. Mark Rubnitz, Director of San Francisco Botanical Gardens, tried this and was so successful that he brought Richard his remaining unplanted *Sarracenia* seeds.

To re-create similar propagation, it is imperative to develop methods of control over water, heat, and humidity.

Acknowledgement: A big thanks to Lois Ochs of Raccoon Ridge Nursery who contributed of all the *Sarracenia* seed used in this experiment.

About the authors

Richard Wuydts is the Production Manager and "Master Planter" at World's Rare Plants, and is a renowned expert in carnivorous plant growth. He has over 50 years of experience in the landscaping/gardening arena, and has collected such a large variety of carnivorous plants that he and his wife, Mary, decided to start a business along with their partners Jan and Phil Small.

Chris McCarthy is a marketing professional in the technology industry, as well as a freelance writer, blogger, and editor.