

Building a Germination & Healing Chamber for Seedlings and Grafted Tomatoes

What this workshop is about

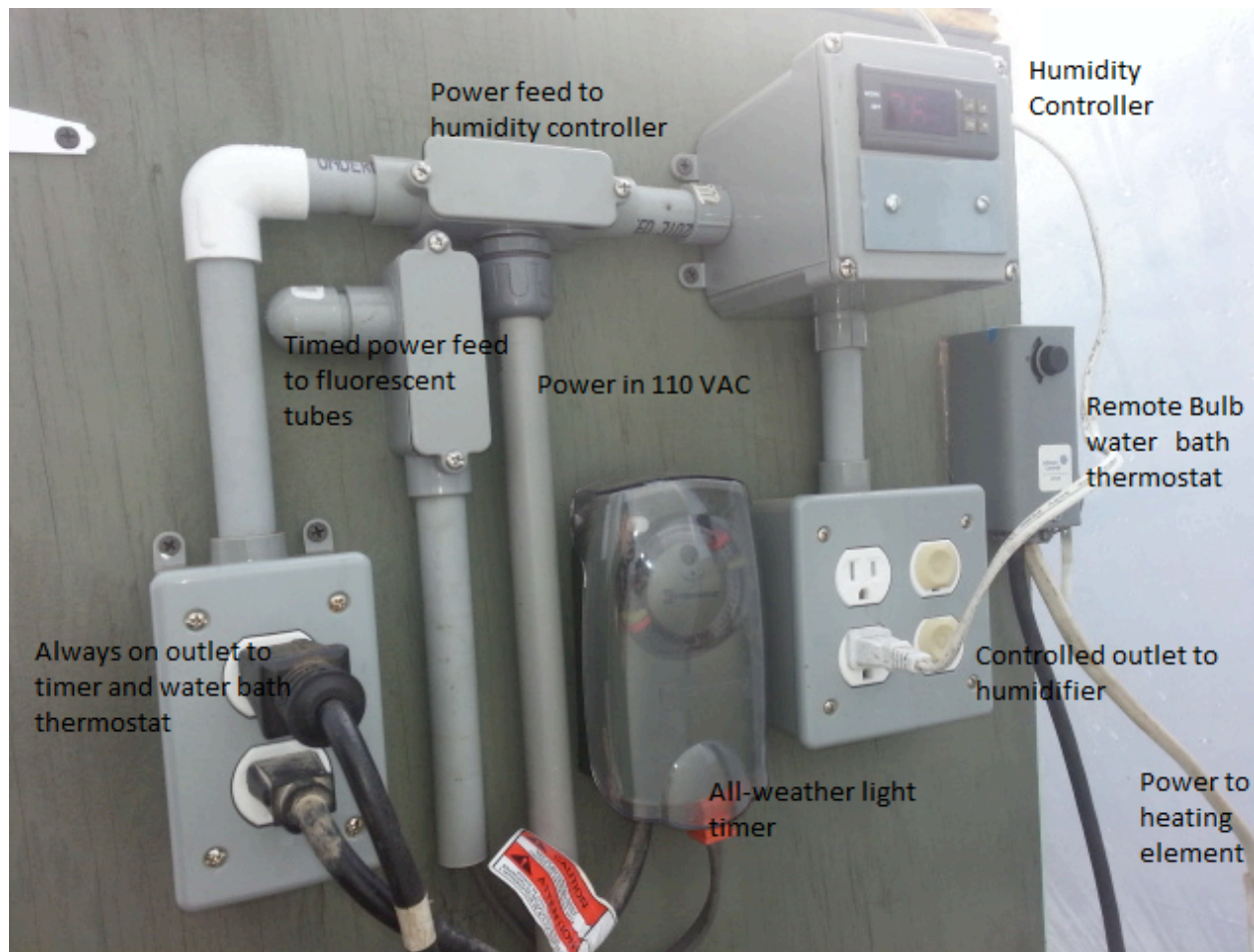
- Creating an ideal environment for seed propagation and graft healing
- Increasing the success rate of seed starts
- Maintaining consistency and timing of seed starts
- Making the technology accessible and affordable by using common materials
- Learning how to set up and assemble simple circuits
- Understanding structural framing and fitting of construction materials

What are the Characteristics of a Germination Chamber?

- High humidity
- Elevated temperatures
- Broad-spectrum or full-spectrum lighting
- Enclosed and insulated cabinet to maintain consistent temps and humidity
- Easy access to seedling trays
- Adjustable shelf levels

Points of Note

- Use of cedar, locust, common pine; avoidance of pressure treated lumber
- Surface treatment of common lumber with linseed oil and turpentine (do not store used rags in containers or piles, they may self-combust. Dispose of in a water bucket.
- Insulation choices; extruded polystyrene versus poly isocyanurate
- Dimension changes for different size trays
- Ground Fault Circuit Interrupter (GFCI) and best practices



Update v.2: Field use of the chamber showed that the original float system for the home humidifier could leak over time, possibly damaging the humidifier unit. It is also somewhat inconvenient to service from the top of the chamber where it was mounted. We redesigned the humidification function to use two mist-maker atomizers similar to the type used in Halloween cauldron displays, reptile habitats, and pond fogging. These are 24-volt DC disc mist emitters which float in the water bath below the tray racks. Mist output with two units is approximately 1000 ml/hr. They plug in with included transformers to the controlled outlet where the humidifier was originally supplied from.





Materials

Bath pan 6" x 20" x 79" with 2" perimeter fold galvanized sheet metal 18g (locally fabricated)

Corner supports 1 x 6 x 12-ft solid composite decking (cut to 2-3/4" x 36" strips; 8 total)

Insulation 1-inch extruded polystyrene XPS sheets 48" x 96"

Plywood exterior 5/8 x 48" x 96" sheets (paint to suit)

Rubbermaid or similar shelving racks 16" x 48" cut to 24" lengths

Electrical Metallic Tubing (conduit) 3/4" cut to chamber length

1-1/2" x 1-1/2" x 1/8 aluminum angle

Henry Co. 212 All-Purpose Sealant

<https://us.henry.com/roofing/roofing-sealants/212-all-purpose-crystal-clear-sealant>

Fluorescent fixture Lithonia Industrial two-lamp outdoor wet-location listed
Model # XWL 2 32 120 RE

T8 bulbs 32 watt (2) daylight 6500 Kelvin and (2) warm white 3000 Kelvin

Line Voltage Remote Bulb Thermostat w/ 6 ft. Capillary, SPDT, (30°F to 110°F) Johnson
Controls A19AAB-4 or Siemens ET-141-0520 or Ranco ETC-111000-000

Heating element bolt-on Low Watt Density 110VAC, 1500-watt Model TG-1157L

Mist-Maker atomizer w/float, 110VAC input 24VDC output, 500 ml/hr (various manufacturers)
https://www.amazon.com/Mist-Maker-Kit-transformer-replacement/dp/B00FGUXLY6/ref=pd_day0_86_7?_encoding=UTF8&pd_rd_i=B00FGUXLY6&pd_rd_r=TDPAG75BQ13N91XCQH71&pd_rd_w=r1Lwx&pd_rd_wg=LN2IK&psc=1&refRID=TDPAG75BQ13N91XCQH71

Willhi IMAGE Digital Humidity Controller Model WH8040, remote sensors 110VAC, control
range 1% to 99% RH

Intermatic 24-hour outdoor weather cover timer, 15-amp plug-in HB11-K or similar