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DIY Heated Benches for Extended Winter Growing

Simple Gifts Farm in Amherst, MA

Jeremy Barker-Plotkin at **Simple Gifts Farm** in Amherst, MA has created a unique heated bench system inside his greenhouse to maximize growing potential while minimizing heat inputs. The heated bench system helps create a micro zone within the greenhouse for year round seed germination, makes it possible to easily grow and supply microgreens and pea shoots to their farm stand in winter, and creates a protected place in the spring to start field transplants. The benches are modular, easy to repair, and have an additional separate plastic cover made out of recycled greenhouse plastic that can be rolled over the entire bench for extra insulation as needed.



Figure 7: A variety of high value greens can be grown over the winter using the heated bench and raised beds system.

A Harman PB105 Pellet Boiler is located in a small shed just outside the greenhouse. This small pellet stove is used to primarily heat the constructed bench system, though the extra heat help maintain greenhouse temperatures as well. The stove is fed twice a day during the winter and heats water-filled pipes that convey the heated water to the bench inside the greenhouse and through several radiant heat panels under the seedlings. The hot water



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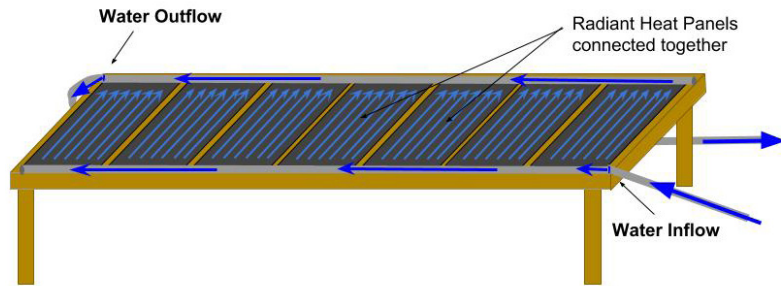


Figure 3: Water flow for the heated bench system. Notice the water outflow is at the opposite side of the table from the inflow.

is fed through the pipes and under the seedlings, circulating to be reheated from the stove. The greenhouse is hooked up to supplemental propane heat to maintain a temperature of 34 degrees as needed, though excess heat from the heated bench system makes the need for propane fuel at a minimum. Jeremy gets his "Radiant Root Bench Heating" panels from AIM Radiant Heating (aimradiantheating.com).



Figure 4: Notice plastic cover frame made out of metal pipe conduit allowing the plastic to easily roll over the seedlings.

The radiant heat panels rest on top a wooden bench structure. The bench at Simple Gifts Farm is constructed to be 2.5 feet off the ground (a good height to easily work with the seedlings), 5 feet deep (the length of the panels), and 30 feet long, although the total length and height of the bench can vary based on the needs of the farmer. Metal pipe conduit is attached to the wooden bench base to provide support for the plastic cover for extra seedling protection on very cold nights or to retain heat for sensitive seedlings like tomatoes in early spring.

Any extra heat from the heated bench system helps support the rest of greenhouse with five raised beds spanning the length of the greenhouse. The raised beds help

maximize growing space by maintaining very narrow pathways. Rebar rods help keep the wooden sides of the raised beds firm, upright, and in place. The raised beds are either seeded directly or planted with transplants started on the heated benches.



Figure 5: Heated Bench on the left side of the greenhouse with raised beds growing winter greens.

In the spring as the need for winter greens decreases and production shifts to the fields, the raised beds become "benches" themselves for trays of transplants before they are brought out to the fields. To create a level surface separate from the soil surface,

landscape fabric is stretched across the raised beds, held down with old drip tape, and stapled in place. Stackable wooden trays (that are made on-farm) span the raised beds and make it easy to hold and easily transport multiple trays of seedlings.

The simple and functional heated bench design at Simple Gifts Farm allows the farm to produce lettuces, chard, kale, pea shoots, microgreens, scallions and Asian greens year round. The heated bench is integrated seamlessly into a system that cleverly maximizing space and growing potential in an efficiently heated greenhouse.



Figure 6: The tunnels are still growing greens in early spring, but are transitioning to supporting spring field production. Notice the trays holding multiple seedling trays laid over one of the raised beds, which has been harvested completely. The trays allow the farm crew to efficiently move many seedling trays at once.