

GROWERTALKS

Columns

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Tips for Making Smart Heating Decisions

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Heating is one of the most important components of a green-house operation, so it's important to do it right. Talking to experts and others in the industry before you invest can be extremely beneficial in helping you make the right greenhouse heating decisions.

To get the most value out of a heating system, evaluate your growing operation's needs thoroughly before making a decision. Consider the following:

Cost and efficiency | Some greenhouse heating systems are more efficient than others. While you might pay a bit more upfront for a highly efficient system, such as a hydronic floor or bench heating system, the long-term cost savings can make it worthwhile. Hydronic systems work with the greenhouse boiler, which heats water that's pumped through tubes running throughout the greenhouse. These systems operate using a closed-loop system, which means very little heat is wasted as the water circulates through the tubes. Because radiant heat creates a moist environment, water usage also is reduced.

Centralized or localized? | Centralized systems typically use a boiler to generate heat in one spot. Piping is then used to distribute the heat throughout the greenhouse. Centralized systems are often more efficient for large operations. However, the cost of installing and maintaining one can be high and difficult to justify for smaller operations. These systems generally distribute heat as either steam or hot water of varying temperatures. Hot water systems require more complicated plumbing and circulating pumps. In addition, they require large volumes of water to achieve heat levels. Steam systems require less plumbing and no circulating pumps. They provide more BTUs and allow for more rapid temperature adjustments. However, they don't provide heat reservoirs.

Localized systems are situated in the section of the greenhouse that is responsible for heating. There are many types of localized heating systems, ranging from gas-fired and hot water unit heaters to radiant bench, under-bench and floor systems, which often are the systems of choice for propagation and germination (see crops grown/production practices below).

Crops grown/production practices | Are you starting plants in your greenhouse or just finishing them there? Radiant floor or under-bench heat is especially beneficial for rooting because it heats the soil directly, as opposed to heating the air around the plants. This helps accelerate germination, resulting in quicker turns.

Heating system size/output | Be sure you're providing enough heat to keep plants warm and healthy based on your local climate and greenhouse size. Remember, forced air heaters will heat the air around the plants, making it harder to provide optimum root zone temperature compared to radiant floor or bench heating systems, which heat starting at the soil level. While hydronic heating is highly effective and efficient, most growers—especially those in colder climates—likely will need to supplement with unit heaters during the coldest months.

Plant quality/health | With radiant floor and bench heat, the soil is heated evenly, so plants grow more uniformly compared to those grown using forced-air units. Crops grown with radiant floor or bench heat also benefit from reduced disease incidences.

Avoid common heating mistakes

One of the biggest mistakes growers can make is to design and supply their heating systems themselves, which can result in errors in sizing and in equipment choices. For example, a grower might buy a high-efficiency condensing boiler when he's running a high-temperature system. Because a condensing boiler only runs high efficiency at low temperatures, the grower has wasted money on high-efficiency equipment he won't actually benefit from.

You also should avoid turning to a local HVAC contractor or plumber that doesn't deal specifically with greenhouse heating. Instead, contact greenhouse-specific companies and ask for bids and ideas. They likely will have a much better understanding of your needs.

No matter which system you choose, to get the best return on your heating investment, make sure your structure is free of air leaks and that you have measures in place to keep the heat you're paying for inside the greenhouse. This means inspecting glazings, walls, doors and vents for cracks or leaks. Also, be sure to inspect your heating system annually to keep it running smoothly. **GT**

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