GROWERTALKS

Features

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Greenhouses Upgrades Part I: A Transplanter! No, Booms! No, a Seeder!

Chris Beytes



Hot Water Heat

If I were a grower, I would want to put my precious capital into something that helped me reduce costs, reduce labor and increase quality all at once. Hot water heaters can do just that.

To do a good job of heating your greenhouse space means delivering the heat evenly. The heat should be delivered in a way that allows your plants to take away the most benefit possible. We call this “distribution efficiency.” If you heat with hot air furnaces, no matter the type or efficiency, your distribution efficiency is probably around 50%. This means of all the heat you generate, only about 50% is put to good use by your plants. The rest is lost to leakage in your glazing, or rises immediately to the peak, where it does nothing beneficial for you.

If you heat with under-bench pipes, or tubes in concrete or soil, you’re getting more benefit from your heat. Depending on how you distribute it, your bottom heat can range from 60% to close to 100% efficient for conductive systems like bench or floor heat.

If you already have a hot water system with insulated pipes and “smart” control that raises and lowers the water temperature to match your “load,” then examine where that hot water is coming from.
Boiler technology has improved immensely in the last few years. There are now super-efficient boilers called “direct-condensing” boilers. Unlike the locomotive boilers of yore, these new units wring every possible bit of heat out of the combustion process. They do this by allowing the “flue product” to condense inside the boiler. “Direct” condensation forms on the heat exchanger and drips out the bottom to drain.

In conventional boilers, condensation formation has long been a no-no as it has a pH of about 4.0 and basically attacks the metal in the boiler. But these new boilers are made of better materials like stainless steel that can handle it.

These new boilers are to be taken seriously. I just spoke to two growers that have been racking up huge savings compared to the operational costs of their old boilers. And the good news is they come in the big sizes we need—up to 12 million BTU.

Start with an open mind, then call in a greenhouse heating expert to assess your current efficiencies. You'll soon become convinced that redoing your heating system is the best investment you can make this summer.

—**Jim Rearden**, TrueLeaf Technologies, www.trueleaf.com

Energy Curtains

If you only have the funds for one investment this year, energy curtains have to be at the top of your list. Why? Because no other greenhouse tool offers such a broad range of benefits and a quicker payback than a good curtain system. Here are the top five reasons why you should invest in a curtain this year:

Year round energy savings. Curtains reduce energy consumption 30 to 40%. During winter months they lock in heat at night, when 80% of heating costs occur. In warm weather the curtain can cool the greenhouse 10 to15 degrees.
This passive cooling is a lot less expensive than running fans. You can use the USDA Virtual Grower program to estimate potential savings. (www.ars.usda.gov/services/software/download.
htm?softwareid=108).

Improved crop quality. Curtains provide control over light level, temperature and daylength, all of which result in a better crop.

Increased comfort. Curtains add to human comfort by keeping the greenhouse warm and cool. Your workers will be more productive and your customers will be more likely to come and stay longer.

Blackout environment is essential for some crops. There's an added benefit in that photoperiod (blackout) curtains provide maximum heat retention at night.

Long-term investment with a quick payback. Generally, curtains pays back within a couple of years (depending
on fuel costs, location, use of structure and so forth). Plus, it's a piece of equipment that lasts for decades (the fabric generally needs to be replaced 8 to 10 years but the mechanics, especially of a push/pull system, last for decades).

In addition, there are often rebates available to help you pay for the system. Because curtains have such recognized benefits, most grant programs have the data to confirm their energy-saving benefits. In many cases there is an automatic rebate when installing curtains.

If you're still not convinced, talk to any grower who has a curtain. They'll tell you it was one of the best investments they ever made.

—**Patricia Dean**, Wadsworth Control Systems, www.wadsworthcontrols.com

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Ebb & Flow Benches

If you grow on regular benches (wood, wire mesh, expanded metal, and so forth), upgrading to an ebb & flow bench system offers many advantages:

One person can water an area as large as one-half to one acre in maybe 30 minutes using a fully automated subirrigation system. Compared to hand watering, this can be a 90%-plus savings on labor.

Because an ebb & flow bench system provides much more even and thorough watering, crops are generally more even, grow 5% to 10% faster, and are of better quality than crops grown with overhead or hand watering. And depending on previous watering methods you've used, you'll see savings of 30 to 80% on water, and 50 to 90% on fertilizer.

With an ebb & flow system, the area under the benches remains dry, as do walkways. This makes it much easier to control humidity in the greenhouse in the winter (especially in poly houses). It also virtually eliminates problems such as weeds and fungus gnats under the benches. In a retail area, this means a much neater area. And you can water even when customers are present.

Ebb & flow systems can automatically water any size containers, from small pots and flats to 10 in. pots or larger, without a tangle of spaghetti tubes. This is a great advantage if you grow different sizes of plants at different times in the same area.

Ebb & flow type systems usually result in lower disease problems than other methods of watering. Research has shown that it's harder to spread disease problems with subirrigation, since foliage remains dry, there's no splashing, and water flow is typically one-way (into the plant container only, never out).

If you're interested in cutting operating costs in your business, ebb & flow benches are ideal. They save huge amounts of water; all the water and fertilizer used is recirculated, with none wasted and none entering the environment; and you can reduce inputs such as fertilizers and other chemicals.

—**Bruce Zierk**, Midwest GROmaster, www.midgro.com

Conveyor Belts

Conveyor belts continue to lead the way in labor savings on an investment-to-payback basis. This is because their affordability, user friendliness and options have increased significantly over the last five years.

A conveyor belt is much like the escalator at an airport. At airports, they use escalators rather than elevators to move people quickly, because even though a elevator moves many people at a time, it returns empty to pick up the next load. An escalator may only move people in single file, but does so significantly faster than a elevator.

So think of your carts, wagons and staff as the elevator always returning empty, and a conveyor belt like an escalator. Maybe it's only moving single file, but overall it can move a greater volume than other modes of transportation.

Now, since you only need one person at the end of the belt setting plants on tables or floors, you've eliminated all the people loading and moving carts, both full and empty.

Conveyors set the pace and make your employees part of a system. Instead of letting the labor set the speed, you can use the belts to control the speed of your workers. They have no choice but to produce at a constant level. Whether it's a belt that connects two pieces of equipment, or replacing rollers on a planting line, or moving product in and around the greenhouses, using conveyor belts will always speed up the process and payback quickly.

You can use good-quality portable belts, or have permanent belts installed in your houses. Insert that one short belt missing in your planting area to make it all run smoother. Wherever your need is, make the investment and the payback will come back to you sooner than you think. Conveyors can be the missing link in most operations.

—**Isaac Van Geest**, TAVA Systems, www.tavasystems.com

Seeders

If you've only got the funds for one investment this year, consider buying a seeder—either to begin growing some of your own plugs or to replace an older seeder. If you have strictly purchased plugs in the past, the addition of a seeder can give you greater flexibility in variety of product, greater flexibility in the size/type/manufacture of the plug tray you use, and greater flexibility in timing your finished product.

Additionally, you can realize a cost savings in as little as one season through the benefits of reduced purchasing costs and labor if you sow directly into flats (thereby eliminating the need to transplant). Seeding technology has made tremendous progress in the last decade and if you currently have an older seeder, consider upgrading to a seeder that can offer some of the newer generation of additions such as automatic dibbling, automatic top coat dressing, automatic watering, as well as the fully integrated systems that include filling and stacking.

There are three main types of seeders: plate (or hand) seeders, needle seeders and drum seeders. Each offers some of the same benefits. If you're purchasing all of your plugs, you're limited in a number of ways, including availability of variety, timing of finished product and the necessity to transplant plugs into flats at a later date. Additionally, you can use last year's seed (with a slight decrease in germination) whereas you can't use last year's plugs.

The smallest (and cheapest) of all of the seeders is any hand seeder, and most plate seeders. These seeders are affordable options for the small grower, or a larger grower looking to sow only a few flats at a time. They are flexible, but not "automated," so speed isn't one of main benefits. The next option is a needle seeder. They can be more automated but are still simple to operate. Some offer a good deal of flexibility with

regard to quick changeovers (of both seed and trays). Some needle seeders can be used to sow into both plug trays and direct-sow up to 4-in. pots. A plate seeder or a needle seeder would be great for the small- or medium-sized grower.

Drum seeders are typically more expensive, but the level of production they achieve gives the larger grower a quicker payback. Drum seeder technology has moved by leaps and bounds and now they can sow even the most difficult varieties with ease. Growers can also find integrated systems that combine fillers, seeders, top dressers, water tunnels, and tray stacking, making the complete sowing operation as automated as possible. GT

—**Graham Goodenough**, Seederman Seeders, www.seederman.com

(Next month: transplanters, irrigation booms, overhead basket systems, flat fillers and spray equipment)