The use of alternative fuels requires alternative heating systems and a slew of other grower tasks.

by JOYCE G. LATIMER

ANY growers use unit heaters that are most often fueled by liquid propane (LP) gas in individual greenhouses. Conversion to alternate fuel sources is not a ready option. Therefore, compare the costs from different fuel providers in your area and choose the best deal available. Maximize greenhouse efficiency in terms of space utilization and energy conservation practices. Consider upgrading the combustion equipment in existing unit heaters. The increased efficiency may pay for itself.

Alternative Fuels

With significant increases in the per-unit cost of natural and LP gases, many growers have evaluated alternative fuel sources. Some growers who had previously “upgraded” to natural or LP gas furnaces still had working oil, wood or coal-fired furnaces or boilers connected to their greenhouses, and they switched back to those fuel sources.

When considering alternative fuels, growers should compare unit costs of fuels. Remember to compare apples to apples. In other words, look at all fuel sources on a cost-per-heating equivalent (e.g., dollars per million BTUs).

Growers should also consider the dependability of the fuel source. Make sure sufficient quantities of an acceptable quality fuel will be available when needed.

In addition to actual fuel costs, calculate the cost of converting to the new heating system and the labor involved in operating the new system. Remember, coal and wood-fired boilers or furnaces require additional labor investments and you will also need a means to dispose ashes.

Alternative Heating Systems

Many growers have also considered changing the primary heating system. Alternatively, growers should evaluate the efficiencies of different heating systems and consider using combinations of different types of heating systems for the greenhouse. Evaluate the newer, more energy-efficient heating systems to determine the payback period for individual operations. It may be worth the investment.

In addition, growers should consider adding higher efficiency bench or floor heating systems in root zones of areas that require higher temperatures, such as propagation or seedling and plug production areas. These systems consist primarily of electric cable or mat systems for small-scale implementation. For larger areas, hot water piping – on or under benches or in the floor – provides excellent growing conditions for roots while reducing air temperatures. In general, less-than-optimum temperatures have a greater effect on plant roots than on plant shoots.

Regarding hot water boilers, modular, low-mass boilers that are very energy efficient are now available for individual greenhouse heating. They heat smaller amounts of water combined with the more efficient heat delivery capacity of aluminum pipes, fins and plastic tubing. Hot water heat provides gentler, more uniform heat than hot air heaters.

Hot water unit heaters are a factor, as well. Improvements in efficiency in heat exchangers and low-volume tubing have increased the efficiency of these units as well.

Changing Growing Practices

It is logical that reducing the greenhouse temperature, especially at night, would reduce heating costs. In fact, reducing the night temperature by just one degree can reduce a greenhouse heating bill by 2 to 3 percent. So, how low can we go? Greenhouse temperatures affect plant growth and flowering. In particular, they affect the time required to finish the crop. Be aware some plants are more sensitive to lower temperatures and may cease to grow when a base temperature is met. This base temperature is lower for cool-season crops than for warm-season crops. In addition, growth is more strongly affected as the temperature approaches that base temperature.

Also, be aware that lowering the greenhouse temperatures can cause additional disease problems. You may want to run plants at optimum temperatures until the roots reach the edges of pots. Then, lower the temperatures and run the plants drier to prevent root rot. Avoid overcrowding and provide horizontal air movement to ensure uniform temperatures and dry foliage. Use temperate irrigation water in the morning so the medium warms up faster and there is better nutrient uptake.

Recovering Costs

Whereas fuel costs normally account for about 7 to 10 percent of the costs of production, in the 2000–2001 heating season that cost was close to 20 to 25 percent of the total. Most greenhouse growers’ profit margins are less than 10 percent. So how can growers recover the “loss” of this much money? First, growers must recognize that in order to stay in business, they must recover at least some of these costs. Very few growers are financially
able to absorb these costs and remain in operation. This industry is traditionally one of the last to raise prices or add surcharges to their products, but it is an option.

As fuel costs increase, the costs of pots, plastics, chemicals, fertilizers and media components also increase. Availability issues of some fertilizer sources also contribute to increased input costs.

Growers must know their costs of production. Put pencil to paper and calculate all the costs. Develop a budget for the greenhouse operation and specific seasonal crops that will allow determination of the likelihood of making a profit and allow determination of the break-even points. This will allow the grower to determine the relationship between the minimum volume sold and the minimum selling price per flat.

Dr. Forrest Stegelin, Extension agricultural economist at the University of Georgia, prepared an enterprise budget for bedding plants. Based on that budget, he calculated the expected results of changes in different factors of production. For example, a 1 percent increase in the utility rate for heating with natural gas decreased profit by 2 percent. However, a 1 percent increase in the selling price of a flat of bedding plants will increase profit by 16 percent. Or, a 10 percent increase in the selling price of a flat will increase profit by 160 percent.

In many cases, growers are not comfortable adding a price increase sufficient to recover significant increases in fuel costs. In other cases, prices were set for many customers prior to the fuel crisis and growers wanted to honor those commitments.

Therefore, many growers across the country added fuel surcharges to their product prices. After doing the cost of production calculations, several growers found that adding a fuel surcharge to everything they sold during the spring would reverse their losses and restore a profit. They passed the fuel charges on to their customers, who in turn passed it on to the consumer. Economists tell us that most consumers do not remember what they paid for plants last year and are not likely to notice a 50-cent increase per pot. Growers must determine their costs and plan how to recover excessive costs due to high energy costs so they can afford to stay in business.

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