A strong economy has lead to significant increases in disposable income in the US. In turn, the turf industry has benefited with new construction and enhanced budgets at existing facilities. However, recent concerns with fuel reserves, production, and the influence on price and availability are reminiscent of the fuel crisis and sluggish economy of the 1970’s. How would increased prices and decreased availability of fuel influence the turf industry?

Turfgrass management requires a significant amount of fuel (nonrenewable energy) for the production of fertilizers and pesticides, equipment use, and irrigation. A 1980 National Academy of Science Committee Report suggests that world production of oil and gas was expected to peak by the end of the 20th century, followed by increased prices and strained reserves. It appears that based on the current situation, their prediction was correct.

Environmentally, there are additional costs associated with carbon emissions from gas powered equipment. Ten years ago scientists from around the world gathered at the Intergovernmental Panel on Climate Change and concluded that as a result of human activities the earth’s temperature will increase a few degrees in the next decade. This point of view was initially considered controversial without significant scientific support. However, a host of recent measurements have supported the exact conclusion that the earth is warming.

Energy Crisis?
It’s Déjà Vu All Over Again

Presidental candidate Al Gore has raised the public discussion of the issue of global warming in his book, Earth in the Balance. This book has been attacked in the turfgrass trade literature for being extremist. Consequently, many in our industry oppose a Gore Administration, fearing an increase in environmental regulation. Regardless of who becomes president, the turf industry should be aware of the economic and environmental aspects of non-renewable energy consumption.

An Energy Sink

A chapter in the 1992 Turfgrass Monograph from the American Society of Agronomy reviewed the issue of energy use and turfgrass maintenance. The authors suggest that the portrayal of the excesses of turfgrasses and its ultimate futility are only one side of the energy issue. They contend that there is a great need for the industry to always strive to reduce the use of nonrenewable energy, improve the public’s understanding of the benefits of turf, and recognize that little information exists on the costs and benefits of turf.
Electric mowers use half the energy of gas powered. Dull-bladed mowers use 22% more energy than a well-sharpened mower. A reel mower is three times more efficient than a rotary mower. How would we rethink our mowing practices if energy costs forced us to look at these issues?

In fact, on a per unit area basis, the maintenance of edges and borders is more energy intensive than mowing large areas. A 1983 study conducted in Utah demonstrated how almost 50% of the labor spent on mowing was for edging and trimming, in spite of the fact that it performed only half as much.

**Mowing Energy**

The Florida energy study indicated that mowing accounts for 50% of the energy used in turfgrass management. Interestingly, only 2-14% of the energy is used for cutting the grass leaf. The remainder goes to throwing the leaf and to engine inefficiency. Nearly 25% of the energy cost of mowing is associated with the manufacture and purchase of the equipment, with the remaining 75% attributed to motor and drive train losses and moving air. Energy use is increased when the grass is mowed wet rather than dry.

Electric mowers use half the energy of gas powered. Dull-bladed mowers use 22% more energy than a well-sharpened mower. A reel mower is three times more efficient than a rotary mower. How would we rethink our mowing practices if energy costs forced us to look at these issues? Would we mow less area? When we use plant growth regulators (PGR) to reduce top growth and mowing, is the energy saved in mowing used up to produce the PGR?

The old saying the “devil is in the details” is very true when considering energy costs for detailing (edging) turf areas. In fact, on a per unit area basis, the maintenance of edges and borders is more energy intensive than mowing large areas. A 1983 study conducted in Utah demonstrated how almost 50% of the labor spent on mowing was for edging and trimming, in spite of the fact that it performed only half as much.

I can remember being “attached” to a gas-powered line trimmer for weeks at a time, trimming around trees, ball washers, sand traps and difficult to mow areas such as hillsides. Given the energy inefficiency of this cutting, substantial savings could be realized if superintendents simply reduced the need for such edging. Planting ground cover and removing trees would help. So, too, would adopting a scruffier, more classical look.

**Food, Water and Pests**

During the mid-1970s, the price of ammonia used for fertilization more than doubled. As a result, fertilizer prices also increased. In fact, fertilizers have twice the energy per dollar value as the equipment used to manage turf. Even though much less is spent on fertilizers compared to a $25,000 mower, the energy needed to produce the fertilizer based on what you pay for it is considerably higher than the...
Energy Conservation

Very little research has been conducted on energy conserving turfgrass management. We are generally concerned with pest control and other measures which produce improved turfgrass quality and aesthetics. In the industry, how many turf managers take the time to review annual maintenance for energy use? Records like this might reveal how much energy use has increased over the years as use has increased. At this point in time, in real dollars the additional cost for energy may not be prohibitive. But at some point it might be.

Audubon International includes energy efficiency as a component of its Cooperative Sanctuary and Signature Programs. These programs not only look at the turfgrass area, but also at the entire facility management—an important clarification when viewing energy costs and evaluating efficiency. Nevertheless, we have significant challenges and opportunities ahead of us in the area of energy efficiency.

Frank S. Rossi