drive down the street and see sprinklers running when they shouldn't be or water sprayed onto the pavement, they tend to blame the turf."

Dymond admits educating the public is a tall order and a job the industry needs to do better.

"People have to realize there's a big difference between keeping their lawns alive and keeping them lush, especially when water is scarce," Dymond says. "We try to teach our customers to teach their customers to irrigate the grass only when it needs water, to wait until the grass begins to wilt. It will tell you when it needs water. Don't water it because it's Tuesday or because the clock is set at a certain time."

It's equally important property owners follow other proven cultural practices, too, Dymond says. These include not fertilizing lawns too much and mowing them at the height most advantageous to each type of turfgrass.

The Green Industry's customer education efforts can't match what the EPA and regional policymakers, with their greater financial resources, can accomplish. For example, regional policymakers are attempting to curb landscape water waste with PSAs, a constant stream of literature and, in many water-scare regions, demonstration gardens to showcase water efficient landscapes.

One of the newest gardens will be installed at the University of California San Bernadino this coming spring.

The Water Resources Institute of Cal State San Bernadino (WRI), San Bernadino Valley Water and several other partners joined this past summer in a successful effort to collect funds for a Water Conservation Demonstration Garden on its campus. The site, which consisted of 1.5 acres of turfgrass surrounded by walkways and parking lots, will become a garden of low-water-use "California-friendly" plants. The site will be open to the public and will also be used educate students, from the grade school to the university level.

"Working together with our partners, this garden will promote a better understanding of water conservation, sustainable practices and energy efficiency," says Randy Van Gelder, general manager of Valley District.

RESEARCH HAS SHOWN OVER AND OVER AGAIN THAT TURFGRASS IS AN EFFICIENT WATER USER.

— **Dr. James Beard**, Professor Emeritus Texas A&M University

PHOTO BY: RON HALL

Betting on technology

The Green Industry, by contrast, is relying heavily on technology to provide water to American landscapes. It's attacking water waste on two broad fronts — smarter irrigation products and also by identifying and, in some cases, developing plants, including turfgrasses, that require less water to remain attractive and healthy.

These efforts are leading to "smarter" products, such as sprinklers that dispense water more evenly and precisely across landscapes, and controllers that use climate- and sensing technologies to supply plants with the water they need — and only what they need.

The industry wants to take the guesswork out of irrigation by taking it out of the hands of homeowners.

On the turfgrass front, experts across the United States are attempting to develop grasses that are even more efficient water users. The efforts are scattered in different regions of the country, looking at different species and cultivars..

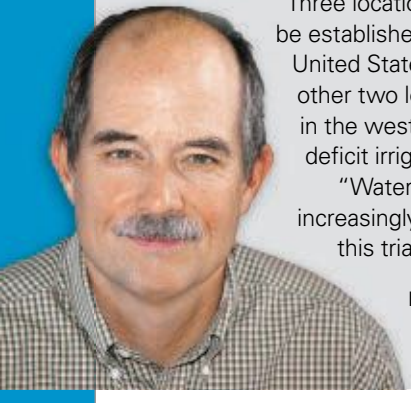
But, developing new, improved turfgrasses takes years even with today's growing knowledge of genetics.

Brilman, one of the relatively small group of turfgrass experts committed to improving the environmental and aesthetic features of turfgrass, says significant progress has been made in

NTEP STARTS SPECIAL TURF DROUGHT TRIALS

The National Turfgrass Evaluation Program (NTEP) is a great information source for landscape and lawn service professionals. The program, headquartered in Beltsville, MD, shares data for 17 turfgrass species gathered from turf trials in 40 U.S. states and six provinces in Canada. It provides information aimed at helping end-users select the turfgrass best suited for their particular regions of the country, specific sites and uses.

In addition to evaluating and sharing data related to turfgrass quality, color, density, resistance to diseases and insects, and tolerance to heat, cold, drought and traffic, NTEP initiated a new trial this year focused on testing the drought tolerance of cool-season grasses at five locations. This will be the first trial in NTEP's new Trait Specific Testing program.



Kevin Morris, executive director of NTEP

Three locations for the drought trial will be established in the eastern half of the United States using rainout shelters. The other two locations will be established in the western half of the country using deficit irrigation testing.

"Water used on turf is becoming increasingly criticized. Therefore, we feel this trial will show improvements in drought tolerance that can help consumers save water in their landscapes," says Kevin Morris, NTEP Executive Director. "Also, since there are municipalities, communities, and even the federal government, that wants to restrict turf use in landscapes, this program is an important step in encouraging development of drought tolerant grasses."

Data about percent green and ground cover throughout time will be collected regularly using digital imaging technology. Highlights of the procedures include:

- Three locations will use rainout shelters, which allow testing of short-term drought situations of 60 to 75 days during two growing seasons. Locations are Fayetteville, AR; St. Paul, MN; and Ithaca, NY.
- Two other locations will measure chronic drought stress by imposing deficit irrigation during two complete growing seasons. Deficit irrigation levels will be determined by the needs at each location, but will range about 50% of evapotranspiration (ET) during spring and fall, and as much as 65% of ET during summer. Locations are Ft. Collins, CO, and Logan, UT.
- Cool-season species will be organized into high-fertility and low-fertility groups. Therefore, low fertility species such as fineleaf fescue will receive only one-half the fertility of species such as perennial ryegrass and Kentucky bluegrass

"In the future, we hope to expand this program to traffic tolerance, salt tolerance and many other important traits," says Morris.

While results from the newly developed drought trials are not yet available, other valuable data related to turfgrass performance can be found online at **NTEP.org**.

developing grasses that remain alive and healthy with low water use.

Unfortunately, property owners (and some contractors, too) seem to be largely unaware of this and lack basic knowledge about turf care. For this reason, they continue to make grass selections on price, she says. Too often the turfgrasses they use to establish lawns represent the cheapest, poorest performing choices.

Brilman says that different species of turfgrass and even cultivars within each species can exhibit widely different degrees of drought tolerance.

Take Kentucky bluegrass, for example. Research has shown some of the improved cultivars of this popular cool-season species, such as the America types, require almost two-thirds less water during the course of a summer to remain green and healthy compared to common types, which are used in a lot of the older bluegrass lawns in the northern parts of the United States, she says.

"If we could convince these people to change and establish lawns with the more expensive bluegrass, they'd need only about a third of the water they're presently using," Brilman says. "The problem is that people still have to know how much water that grass really requires, and only put that amount of water on it."

Basic misconceptions about turfgrass and its water needs color policymakers' perception of its role in landscapes, adds turf expert Beard, who has spend the past half-century researching turfgrass at Michigan State University and Texas A&M.

Turfgrass is an efficient user of water compared to trees and even many desert plants, he adds.

Generally, the water needs of plants are in proportion to the their total leaf areas, he says, a fact born out by the location of forests in wetter climates around the world.

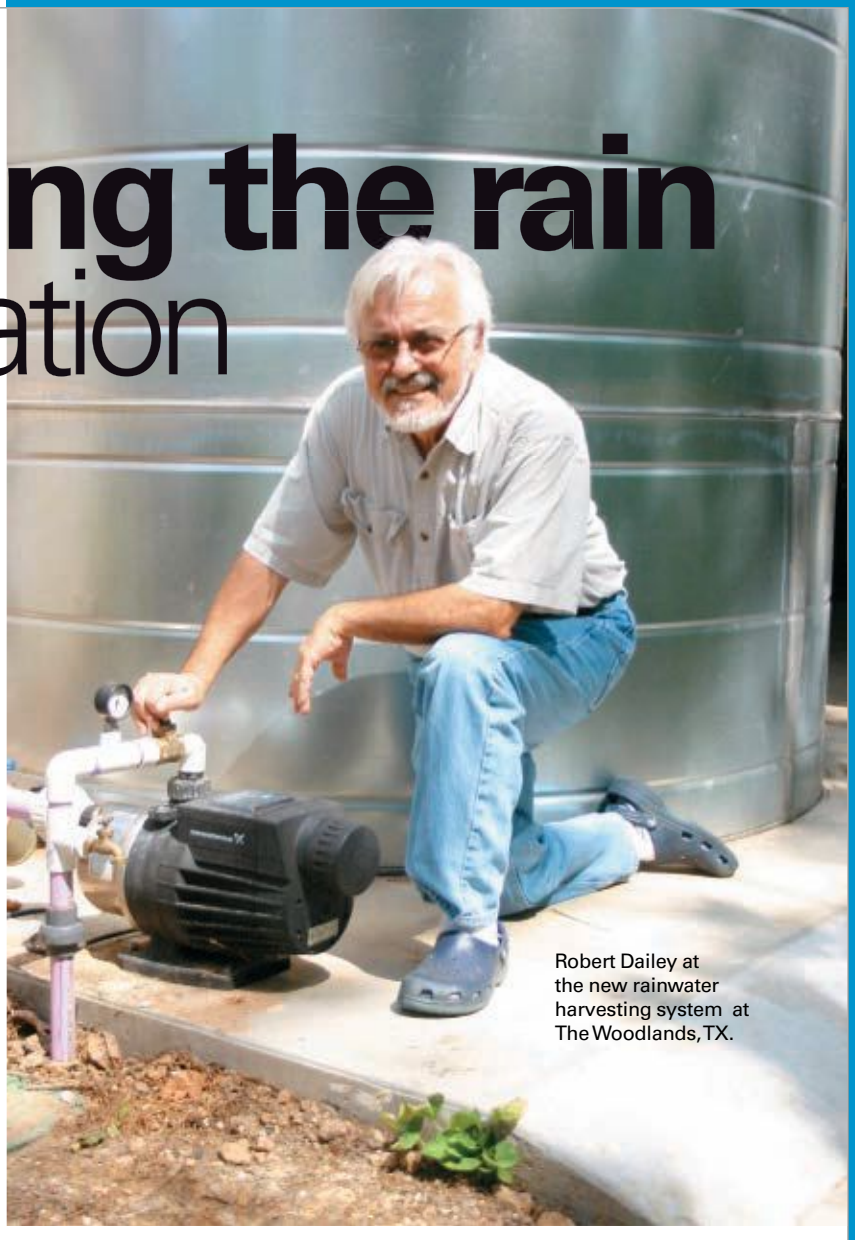
In the end, says Beard, the public will decide the fate of turfgrass on their properties. That decision may rest upon whether they will be willing to pay more for water for irrigation and for improved cultivars that use water more efficiently. Or if they will accept grasses that go dormant or seasonally off color, including when irrigation is not available.

"People may not be willing to accept it, not right away. They'll fight it, at least for a while," says Beard. LM

Catching the rain for irrigation

Interest in rainwater harvesting systems to supplement landscape irrigation is growing, but there's much to learn before jumping into the business.

BY **RON HALL** EDITOR-AT-LARGE



Robert Dailey at the new rainwater harvesting system at The Woodlands, TX.

PHOTO COURTESY: COMMUNITY ASSOCIATIONS OF THE WOODLANDS, TX

Educating your clients about rainwater harvesting systems can provide customers an alternative, free source for irrigation water in the face of increasing water restrictions. And who doesn't like free?

OK, so you've been around long enough to realize that even free usually isn't really free. Yes, there is a cost to using rainwater: the expense of installing a rainwater system, which can be considerable. Add the cost of the system's maintenance, usually minimal. But even these expenses, which vary based on a system's design, size and sophistication, may be a sound investment for many property owners when they consider and tally the expense of replacing dead or dying trees and ornamentals because of watering restrictions.

Landscapes, including expensive specimen trees, get severely stressed and often die because of lack of water whenever a region suffers a severe drought and restrictive watering rules take effect.

As most of us know, local governments and water authorities don't view landscape irrigation as a critical use of potable water, especially on large residential or commercial landscapes where turfgrass is not actively used for sports or recreation.

Look before leaping

Is harvesting rainwater a good business opportunity for a landscape company? Every owner will have to decide that realizing that interest in these systems soars when a region is suffering drought, but demand can dry almost overnight when rains return.

Property owners in regions of the country with persistent water shortages or where potable water is costly are more likely to want them.

The concept of these systems is simple, starting with a design that captures rainwater or snowmelt running off from impervious surfaces such as roofs. The water flows by gravity from a roof, via gutters and downspouts, into a storage tank or underground cistern.

Captured rain supplements traditional sources of water

> DETERMINE THE STORAGE CAPACITY OF A SYSTEM BY THE LENGTH OF DRY SPELLS IN IN A REGION
>
> — **Tim Pope**, President, American Rainwater Catchment Systems Association

The stored water is delivered to irrigation lines by a small pump and is directed to landscape plants. Filters keep debris from flowing into the tank and through the irrigation lines. Keep in mind that because this water has flowed over roofs and other imperious surfaces, it's probably passed over bird waste and other harmful substances. It probably shouldn't be used for anything other than irrigation.

Systems are available in a range of sizes and levels of sophistication — from a simple $50 rain barrel available at most big box stores, to large, above-ground, gravity-fed storage-tank systems or underground cisterns, which deliver stored rainwater to a landscape via 1/2-hp to 1-hp electric pumps.

A supplemental source

The amount of irrigation water a rainwater catchment system can provide depends on the size of the area used to collect the rainwater and the design of the system. A rule of thumb is 1 in. of rain falling on a 1,000-sq.-ft. roof yields 600 gal. of water.

While that may sound like a lot of water, it's not — at least when it comes to watering turfgrass, says Tim Pope, president of the American Rainwater Catchment Systems Association (ARCSA). Installing a system big enough to irrigate turfgrass is rarely, if ever, worth the cost of a system, he says.

Even a professionally designed and installed system is regarded as a supplemental or emergency source of irrigation water, mostly to preserve the health of valuable trees, shrubs and other ornamentals, he says.

Determine the storage capacity of the system largely by the length of dry spells in a region, Pope says. The longer the period between rains, the larger the capacity for storage. In other words, a system installed in Atlanta, which typically receives frequent rains, would require less storage than a system installed for a similarly sized landscaped property in Tucson, where rain is much less frequent.

Pope lives and works out of his home in Friday Harbor, WA, where he has installed about 200 rainwater harvesting systems on the islands in the Puget Sound north of Seattle. Even though capturing rainwater for home use is technically illegal in Washington, Pope says he hasn't been prosecuted.

In spite of the Seattle area's reputation for being wet, it actually receives less total precipitation annually than any U.S. region east of the Mississippi River. In fact, the availability of fresh water in many of the communities on the Puget Sound and around Seattle is scarce, the reason why Seattle has a master water permit that allows residents of most neighborhoods to collect some rainwater.

A similar easing of rain collection by homeowners was approved in

PHOTO COURTESY: COMMUNITY ASSOCIATIONS OF THE WOODLANDS, TX

Colorado as well this past spring. But it remains forbidden in Utah, which continues to honor 19th Century water rights laws that dictate that all flowing water in western states is already dedicated to someone's use.

Even so, interest in rainwater harvesting is exploding, Pope says, citing the growth of ARCSA, which was founded in 1994 in Austin, TX. For example, the association counted 120 members in 2007. This year, there are more than 700 members, including landscape architects, public officials, utilities, regulators and property developers.

Popular in newer communities

Installations are happening at all levels — residential, commercial, community — and since 2008 across entire real-estate developments in New Mexico.

In fact, nowhere in the United States is rainwater catchment systems promoted as vigorously as in Santa Fe County, Bernalillo County and Albuquerque where residents with 2500 sq. ft. or more of property must install an active rainwater catchment system comprised of cisterns. All commercial developments are required to collect all roof drainage into cisterns to be reused for landscape irrigation.

Another striking example of support for capturing and using rainwater for irrigation took place in 2008 in Tucson, AZ, with the passage of a municipal rainwater-harvesting ordinance for commercial projects. Under the law, developers building new corporate or commercial structures must supply half their landscape water needs from harvested rainwater. The law takes effect June 1, 2010.

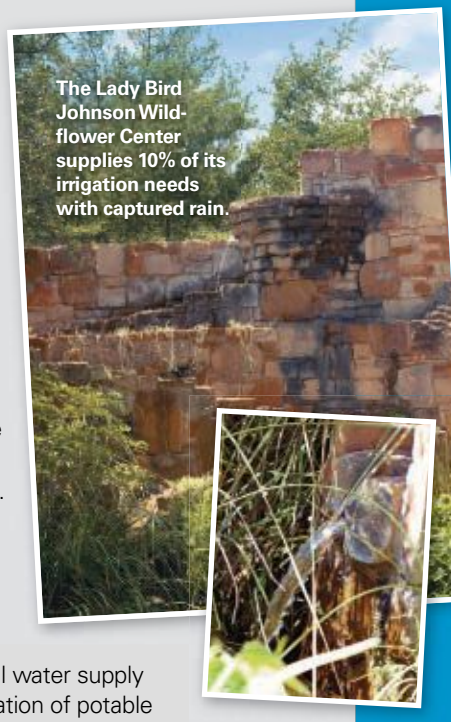
Tucson, of course, is in the Sonoran Desert and receives just 12 in. of rainfall a year on average. With a metropolitan population of just more than 1 million people and growing, the region depends on the Colorado River and groundwater, which it carefully monitors to supply its needs.

Sometimes rainwater harvesting systems serve dual functions — irrigation and also education.

This past summer, the Community Associations of The Woodlands, TX, a master-planned region of about 90,000 people located 28 miles north of Houston, installed a 2,500-gal., rainwater-harvesting tank to collect the rainwater from the office roof at its parks, recreation and environmental services building. The water provides irrigation to more than 1,000 sq. ft. of demonstration gardens on-site. On Sept. 26, the Community Associations invited the public to see the system and learn about rainwater harvesting methods for homes and businesses.

If you're interested to learn more about capturing and using rainwater to irrigate gardens, visit **ARCSA.org** or download the 88-page "The Texas Manual on Rainwater Harvesting" at **www.twdb.state.tx.us/publications/reports/RainwaterHarvestingManual_3rdedition.pdf**. There are several books about the subject, too. LM

NOW THIS IS A RAINWATER CATCHMENT SYSTEM!



The Lady Bird Johnson Wildflower Center supplies 10% of its irrigation needs with captured rain.

AUSTIN, TX — The Lady Bird Johnson Wildflower Center's 14-year-old rainwater harvesting system is an integral part of its architecture, and demonstrates the importance of connecting human culture with the natural world. The collection system conserves water and serves as a public education tool.

The Center collects water from 17,000 sq. ft. of roof, and can store more than 40,000 gal. in five on-site cisterns. The collected rainwater provides about 10% of the center's yearly water needs for irrigation of gardens and landscaping. About 10,600 gal. of water is collected per inch of rain. With an average rainfall of 30 in. per year, this rooftop system can collect about 300,000 gal. of rainwater annually.

The cisterns, one plastic and the others galvanized metal, are linked to the municipal water supply with backflow devices to prevent contamination of potable water. The center has the option to turn to city water, which would bypass the collection system and go right into the irrigation system.

The center was started in 1982 by former First Lady Claudia "Lady Bird" Johnson and actress Helen Hayes, who formed an organization to protect and preserve North America's native plants and landscapes.

First as the National Wildflower Research Center and later as the Lady Bird Johnson Wildflower Center, the facility exists to introduce people to the beauty and diversity of wildflowers and other native plants. Every day, the center brings life to Johnson's vision in its public gardens, woodlands and meadows, as well as in research. In 2006, the center became an organized research unit of the University of Texas at Austin. For more information on the center, visit **Wildflower.org**.

PHOTOS BY JOE MARCUS, LIVING COLLECTIONS MANAGER AT THE UNIVERSITY OF TEXAS AT AUSTIN'S LADY BIRD JOHNSON WILDFLOWER CENTER

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TYLER WHITAKER | The author is a freelance technologist. Contact him at 801/592-2810 or visit www.tylerwhitaker.com.

Google 'waves' at Web collaboration

Are you spending more time in meetings than actually working? Has your fax machine started to memorize certain documents that get passed back and forth with your customers? Does editing a contract feel like a game of hot potato passing changes back and forth?

Well, you may be suffering from collaboration overload. It's a common problem within organizations that rely on committees for everything. But this month, I have good news for you.

Google recently released a new beta product called Google Wave, a revolutionary product that represents the next generation of online collaboration tools. A cross between e-mail, instant messaging and online wiki, it provides a new way to interact with your employees and business partners by creating what are called waves. Creating a wave allows multiple people to simultaneously edit documents, hold online meetings and coordinate projects with ease, all in real time.

Like e-mail, Google Wave has a familiar inbox where you can see new and existing waves from others. But unlike e-mail, all replies and forwards occur within the same wave, which makes it easy to track the entire ongoing discussion in one place. You can edit comments, reply and even have private side discussions all from the same wave window.

That might seem a bit confusing at first, but Google Wave also allows you to see changes to a wave as they occurred over time by using an innovative playback feature. Using playback, you can watch who made changes in the wave as if you were reversing back in time to watch from the beginning. Playback is a useful feature for understanding how people arrived at certain conclusions.

I've been playing with Google Wave for several months now and have concluded there are effective uses for this new tool. Google Wave comes with an ability to add interactive functionality into your waves through the use of extensions also known as gadgets.

For example, if you're planning the next company barbeque, you can include the weather forecast using the Accuweather.com extension. You also might include an interactive map gadget to give the address and directions, as well as an interactive yes/no/maybe gadget to determine a firm count of the guest list.

The real power of Google Wave comes from its ability to quickly bring all the power of e-mail, instant messaging and interactive Web pages together into one central location.

But there's a downside to this powerful technology. With all the speed that comes with using Google Wave, it can be a productivity drain. There's something about watching others type that's quite hypnotic, and, if left unchecked, you might find yourself collaborating the day away. The best practice is to limit the number of people you're collaborating with by limiting the topic of each wave. Use the tool to plan the barbeque not rewrite the company business plan.

While online collaboration tools have been around for years, Google has a great new solution that may finally bring collaboration to the masses. As with Gutenberg's moveable type printing press, Bell's telephone and the rise of Internet, history has shown decreasing the lag in communication has increased the speed of innovation.

Google Wave has the potential to usher in a new set of communication tools and fundamentally change the speed of business. So buckle up. We're in for quite a ride.

Google Wave has the potential to usher in a new set of communication tools and fundamentally **change the speed of business**. So buckle up. We're in for quite a ride.

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ACUTABOVE

GREEN INDUSTRY MAINTENANCE LEADERS » **BY DAN JACOBS**


John Miller, president & CEO

Formed in 2008, **Yellowstone Landscape Group** serves as the parent of three well-established Green Industry companies: BIO Landscape & Maintenance, Piedmont Landscape and Austin Outdoor. President and CEO **John Miller** provides his insight on issues facing maintenance companies.

TOP TRENDS

» **Reduce costs.** There has been considerable pressure from our client base to reduce the cost and therefore, to some degree, the level of service. More than half of our customers have looked for ways to save money in their landscaping budgets. We work with them very closely to do that. The way we've tried to do that is to go over in considerable detail areas they can pick and choose some reduction in level of service.

» **Adding services.** A number of folks in the Green Industry and even some general contractors have tried to get into a different part of the landscape industry. Where they have been heavily construction oriented, they're trying to get into the maintenance side of the business. You can't blame them because the installation side of the industry has certainly suffered significantly. They just aren't familiar with some of the costs. That creates some difficulties for the incumbent maintenance company, and it creates some real challenges if they bid it too low — they actually have made their situation more complicated.

» **Stimulus money.** The stimulus money that was promised to improve the economy — we have seen very little impact in our market from anything coming out of Washington. We're not sure if we ever will. We're certainly not counting on something coming out of Washington to save the day.

INSIDE INFO

Company: Yellowstone Landscape Group

Headquarters: Plano, TX

Year established: 2008

Employees: 1,000 in season; 650 out of season

Annual revenue: Nine figures

Keys to being a maintenance leader: You have to deliver the level of service the customer expects. Maintenance runs a broad gamut, from resort and elite (properties) to tractor mowing of centerlines. Those are radically different kinds of maintenance situations. You need to deliver the level of service for customer expectations. If you give too much, it's going to have an impact on your bottom line. If you don't deliver enough, it's going to have an impact because the customer is going to go to somebody who will deliver the level of service that's appropriate.

TOP OBSTACLES

» **Tightened lending.** We are fortunate that we are well supported and have an adequate financial position. Our relationship with our lenders is sustaining. But we certainly have encountered companies that have received a great deal of pressure from their lenders. In certain circumstances, credit lines have been reduced or, heaven forbid, not renewed. It's very disturbing to see some of the lenders are not as supportive as one would like them to be. We hope that it will improve over the next year to 18 months.

» **Acquisitons slowed.** It's very difficult, except for the larger enterprises, to do any acquisitions, because the banks are not that enthusiastic about lending money to support an acquisition.

» **Staff reductions.** If your level of business is reducing, then unfortunately, you have to make some very difficult calls on manpower levels. Nobody wants to let good people go. We have thus far been reasonably successful in retaining our talented people. A lot of the things that you would like to do are just going to have to be deferred.

TOP OPPORTUNITIES

» **Gaining market share.** If you have your costs in line and you are competing with people who don't know their costs, you may have some opportunities to selectively assume some business from some other folks in the marketplace. That sounds kind of cannibalistic or predatory. It's not meant to be. Your costs have to be aligned with the market conditions.

» **Financial stability.** This is also — in a left-handed way — to look at the structure of your business and determine if there are some things you need to get more efficient about.

» **Political savvy.** I would recommend people look at some of the things that are changing in Washington. There are big challenges out there. What's going on in Washington can impact their businesses quite significantly. We're talking about everything from health care to carbon footprint.