

# War over water

AS WATER USE CONCERNS REGULATORS, SUPERINTENDENTS WORK TO IMPROVE IRRIGATION EFFICIENCY AND THE INDUSTRY'S IMAGE

by  
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**G**olf courses use a lot of water – more than 476 billion gallons of water annually in the United States, according to a study by Dave F. Zoldoske, director of the center for irrigation technology at Cal State and international water technology at Fresno State. In particular, water consumption is the highest in the Southwest, which uses an average of 88 million gallons annually per course, the study says.

This wouldn't be such a problem if suitable water sources weren't in short supply. Jim Barrett, president of James Barrett Associates, an irrigation consulting firm, says 97 percent of the world's water isn't fit for irrigation; 3 percent is fresh water, 2 percent of which is locked up in polarized caps and glaciers; and 1 percent isn't renewable.

"Water is going to get chopped off, and we need to be prepared long before that," Barrett says.

Water usage is a chief concern for golf course superintendents who are fighting for availability and battling negative public perceptions that golf courses waste water. Actually, many golf course superintendents say they use water efficiently, thanks to precise irrigation systems. Superintendents say the industry needs to communicate its best water management practices to regulators, legislators and the public.

## Not only a Western problem

Conservation has become especially important as water sources dry up throughout the country. Doug Bennett, conservation manager for the Southern Nevada Water Authority, says



Barrett

the region is in the fifth year of a drought cycle. The Colorado River is producing one-fourth of its normal flow; Lake Mead dropped 90 feet during the past five years and is 50 percent to

capacity; and Lake Powell dropped 100 feet and is 40-percent full. The lakes are the two largest man-made reservoirs in the West and are shared by seven states and Mexico, according to Bennett.

"Everyone is operating under a drought plan," he says. "Water is scarce. We need to conserve to maximize use of available water and build reserves."

In fact, most golf courses in the Southwest that are connected to a municipality receive potable and reclaimed water.

"They also can obtain water rights from the state, but they would have to transfer them from another owner because all of the rights are spoken for," Bennett says. "Some golf courses may have wells in addition to a municipal connection."

Of course, conditions vary throughout the country, but the worst drought area is the lower Colorado river base – Colorado, Nevada and New Mexico – according to Brian Vinchesi, president of the Irrigation Association. Golf course superintendents are coping with this drought via regulation. The amount of water they use depends on the number of turf acres and type of turf. For example, Phoenix restricts the amount of turf a golf course can have, and in Las Vegas, 6.5 acre feet of water per one acre of landscaped area (energized with an irrigation system) is allowed annually.

Water use on golf courses is a challenge in the East, as well. Golf courses in that region have permits allowing a certain amount of water.

"There is a lot of competition for water," Vinchesi says. "Everyone needs a water withdrawal permit, and nobody wants to do it because it's expensive and time consuming. In New Jersey, it's impossible to get [additional] water for a golf course. Connecticut



Vinchesi

and Massachusetts aren't far behind."

And there is temporary regulation throughout the country.

"States have legislated water usage," Barrett says. "I certainly wouldn't be surprised if we see more strict regulation throughout the country. For example, people are debating laws about restricting water usage in New Jersey."

In Atlanta, a law almost passed requiring local municipalities to shut down golf course irrigation during a drought, and in Massachusetts, there has been a push to pass a law banning outdoor irrigation, according to Barrett.

"We all know about problems in the West, but it's not a Western problem," he says. "Virginia, North Carolina, Alabama, Florida and Georgia have been fighting over shared rivers. There are plenty of fights for water."

Georgia, Florida and Alabama are in state supreme court fighting over the Chattahoochee River, which separates Georgia and Alabama and runs into Florida, says Mark Esoda, a certified golf course superintendent at the Atlanta Country Club.

In Georgia during the past few years, there also was a 10-inch-per-year deficit of rain that caused a mandatory water-usage restriction in the state, Esoda says. Golf courses are no longer bound by the restriction unless there's a level-two drought, which the state determines by using nine different factors.

Each region of the country has different rainfall and water tables, so everybody shouldn't suffer at the same time when there's a drought, according to Dean Graves, certified golf course superintendent at the Chevy Chase (Md.) Club.

## Improving its image

While water is a limited resource, it's a must for golf courses to stay green – and profitable. The public must be educated about this fact, Vinchesi says.

Steve Swanson, golf course superintendent at the Siena Golf Club in Las Vegas,



The issues related to droughts and golf course water use present concerns throughout the country, but are most recognized in the West.

Photo: The Toro Co.

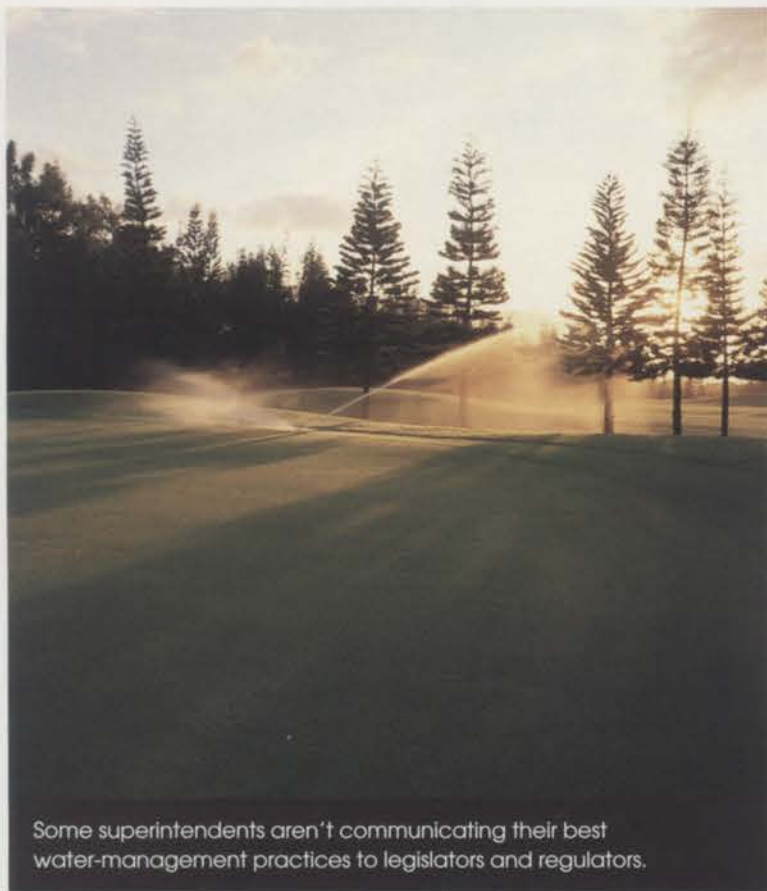


Photo: Rain Bird

Some superintendents aren't communicating their best water-management practices to legislators and regulators.

says the Golf Course Superintendents Association of America needs to promote the best water management practices superintendents use to combat perceptions that golf courses waste water.

However, Swanson says: "Local chapters can only do so much. Communities should pool money to generate something that is effective to erase the image that golf courses are cesspools of waste."

While many superintendents are aware of and employ best water management practices, many aren't diligently recording or communicating them to regulators and legislators, Esoda says. Recording and categorizing practices are musts.

"Golf courses are considered consumptive water users," he says. "We can show people how considerate we are with water. There is a lot of money in the ground to make sure we are watering our courses properly. We have to log our practices to show neighbors and regulators.

"It's economics, too," he adds. "We don't want to waste water because it's an expense."

Barrett blames legislators' lack of knowl-

edge on the industry itself, but acknowledges the GCSAA's and the U.S. Golf Association's educational efforts.

"Compared to homeowners, golf courses are a tiny user of water, and people maintaining golf courses are professionals and understand about overwatering and its effects," he says. "The agriculture industry uses millions more gallons than turf does. Golf is a small percentage of the overall scheme of water users. Water usage on golf courses is a misperception because they are big and visible, but that doesn't mean we're not wasting some water and power through poor management or systems."

The industry hasn't gotten its message out as well as environmental groups have gotten theirs out, Barrett adds.

"People need to look at how many jobs depend on golf courses and how that impacts the economy," he says. "That information needs to get through to regulators who talk about cutting off water."

But the industry has addressed the water quantity concerns by developing more efficient and effective irrigation resources,

## A smarter use of water

**E**ducation, information and more precise irrigation systems have led to more effective and efficient applications of water on golf courses. Superintendents are armed with more information than ever before, which leads to best management practices, according to the Golf Course Superintendents Association of America.

Using more precise irrigation controls to water areas of a course differently and adding weather stations and remote controls help superintendents conserve water.

"That sounds expensive, and it is," says Brian Vinchesi, president of the Irrigation Association. "You're doubling fairway costs with separate irrigation systems. It's becoming more popular."

Auditing an irrigation system also helps.

"A superintendent can see where he is wasting water and what needs more watering," Vinchesi says. "New nozzles help with that, but they are not the answer on every course. A lot of superintendents don't know how water is put through sprinklers, and an audit shows you that."

"New equipment is costly, and not everybody can afford it," says Steve Swanson, golf course superintendent at Siena Golf Club in Las Vegas. "At \$7 a pop for every nozzle, and if you have 2,000 irrigation heads, some can't just change the nozzles. But in the desert, since we use so much water, there's probably not one course that's not up to date with the best irrigation system."

It's all about uniformity and control, according to Jeff Kiewel, national sales manager for Rain Bird's golf division.

"We're constantly working on putting out the right amount of water in the right spots," Kiewel says. "Nozzle and rotor engineers are working on getting better coverage and uniformity. Nozzles are getting replacements every year. Central control also is key. We're focusing on efficiency."

Dana Lonn, director of the center for advanced turf technology for The Toro Co., says the company has spent time and money improving the quality of its nozzles because water uniformity is critical.

"Superintendents always water to the driest area, and if you have poor uniformity, you're wasting water," Lonn says. "The 800 series has been improved. The nozzle is more precise. The nozzle is a sophisticated device. We'd like it to be perfectly uniform, but it's almost impossible."

"There's been a lot of enhancements in central control software," he adds. "In the past five or 10 years, superintendents have gone to more sprinkler heads and more control. Software enhancements make it easier

to adjust. It's more money, but it gives one more capability."

Jim Barrett, president of James Barrett Associates, an irrigation consulting firm, says superintendents can let more areas be native and let drought-tolerant grass grow tall to reduce water usage. Other ways to reduce water usage include cutting turfgrass less frequently and using wetting agents, quick-coupling valves to handle smaller problem areas and species of grass that play well and need less water.

"If these practices were to take place, superintendents need to communicate to members first and be proactive and explain why," Barrett says. "This is more of the direction we should be going. A lot of course maintenance areas that aren't related to the game use a lot of water for aesthetic reasons. Those areas could cut back on water consumption."

When drought became an issue in Nevada, Swanson says his course was ahead of the curve in trying to be more efficient using water.

"I have ryegrass on 95 percent of the golf course," he says. "There is little buffer room. Most people have Bermudagrass and have cut back on water. We converted 35 acres back to a native grass design and reduced water usage 35 percent."

Siena is a public daily-fee facility, and the water Swanson uses hits the bottom line.

"It's imperative that I run water efficiently," he says. "We're constantly updating our programming systems - daily, monthly and yearly."

Pumping water from a municipality to a course more efficiently can also be improved. Integrating local pump station controls with a course's irrigation control system exists but needs to be refined to achieve better efficiency, Kiewel says.

"Right now the interface is a 'Hi, how are you,' and the options are limited," he says. "The software isn't the same. Everybody has that issue, and we want to eliminate that. We're going to get it over time. We're improving efficiency 10 percent a year. That's a lot of water. We're working on nozzles and rotor controls. Research and development is working on system integration. There is room to improve. The gap is smaller this year than last year."

Additionally, effluent water use is gaining acceptance, according to the GCSAA. Oftentimes, the issue is the inability of a municipality or district to deliver water to the golf facility. But there's little doubt effluent water use will continue to rise, especially as it becomes more economical. GCN



Photo: The Toro Co.

Compared to homeowners, golf courses are a tiny user of water, according to consultant Jim Barrett.

which have helped position golf as a responsible consumer of water, according to the GCSAA. The association has used education and information as a strategy to work with its chapters to develop policy and regulation on a local level. In particular, it has worked with its chapters to become involved with water authorities so policies can be established that result in less water usage. Getting its members to serve on water panels and community groups also has been important in educating policymakers, and feedback the association has received indicates superintendents are oftentimes the most informed people on these boards.

Additionally, the GCSAA says it has positioned golf courses as key assets of communities because they provide recreational, financial and environmental benefits. The association also has addressed golfers' expectations for wall-to-wall green courses by communicating that grass doesn't have to be green to be in high-quality playing condition.

Another positive aspect of golf courses is that they are the most conservative users of water, Esoda says.

"And we're environmentally friendly because we'd kill the grass and have a lot of runoff if it was watered too much," he says.

Superintendents are looked at more like environmentalists than they were five to eight years ago, Graves says.

"Golf courses are more of a benefit for the environment," he says. "Chevy Chase Golf Course provides enough oxygen for the residents of Chevy Chase. And due to research, the GCSAA is getting out the good word, but there is still a long way to go. We're an easy target. Five percent of the population plays golf, and we'll be lucky if

one legislator plays golf and understands what we're doing."

### Working with legislators

Promoting best water management practices and the benefits of golf are ways to help prevent legislators from restricting water use too much. Georgia is putting together a planning commission for water management and has to have a water management plan soon.

"We need to work with the commission to make sure golf isn't restricted," Esoda says. "Golf courses in Georgia have been lobbying state legislators to make sure golf is recognized as a water conservator."

Esoda says that by 2006, the GCSAA membership in the state wants at least 75 percent

of its members to use and track best water-management practices so it can show state legislators how they use water.

"When dealing with regulators, you want to talk to them about usage," he says. "They want to know the volume and know how water is managed. When you talk to legislators, you want to explain to them that golf courses are a tax base and income is generated in the state as a result of golf tournaments. You have to explain the business of it and how much of it is an integral part of the economy."

Suppliers are helping, too. Rain Bird's golf division is involved in areas to educate and influence regulators and legislators, according to Jeff Kiewel, national sales manager.



Photo: Rain Bird

The GCSAA is helping to position golf as a responsible consumer of water through education and information.

"We're involved with the federal government to establish water-use guidelines," Kiewel says. "We're in the middle of the fray between the Environmental Protection Agency and golf course development. It's important that we're part of that discussion in finding a middle ground."

### Water restrictions

Superintendents are dealing with water restrictions throughout the country. For example, there are regulations for golf courses in Maryland when droughts occur.

"We can't water the rough and have to hand-water for certain things," Graves says.

"We can water greens, fairways and tees. We can't water from 9 a.m. to 9 p.m."

The former governor of Maryland tried to mandate that golf courses reduce water usage by 70 percent, which is unrealistic, according to Graves.

"We have an efficient irrigation system, and we manage water much better," he says. "We have divided each fairway into six areas. We irrigate each one differently. Each area depends on sun, shade, hills, breeze, etc. Technology is enabling us to segregate a golf course and have it run by a computer."

In Nevada, Swanson says Las Vegas-area superintendents have met with the Southern Nevada Water Authority and discussed water-usage issues.

"It took time to educate the Water Authority about what we needed to service the golf courses and what the authority needed to accomplish," he says. "Ultimately, the goal of the authority was for us to use 6.5 acre feet of water. All superintendents in town fully understand the ramification of the situation. They understand how serious the situation is."

"(Las Vegas-area) golf courses were given a choice of being told when to water or having a budget to stay within," Bennett adds. "Overwhelmingly, they chose the budget and said: 'We'll manage it.'"

Bennett says courses in Las Vegas have implemented a drought plan with mandatory seasonal watering schedules.

"Most water is wasted during the spring, fall and winter – not in the summer when it's the most restricted," he says. "There are times of day when one cannot water."

Although, Bennett says some superintendents are underbudget for water use, and the ones who irrigate a lot get the attention.

"Hand-watering has helped," he says. "The golf industry reduced water use 10 percent during the past year. They have stepped up to the plate. They should be commended."

### Superintendents' reactions

Overall, superintendents react differently to the public's concern about water usage. Some don't do anything unless they're forced to, some are more proactive, and some like watering more than others.

"If you have a really checked-out superintendent, he will do some of water-use-reduction practices on his own," Barrett says. "Some guys won't change so easily because they don't want to lose their jobs because of a brown fairway. They are doing what they're told."

Swanson says many golf courses in Las Vegas are converting peripheral turf zones to drip-style landscape due to the systems water banking abilities. Drip-style landscape, on average, will consume one-fourth the water of a conventional overhead spray



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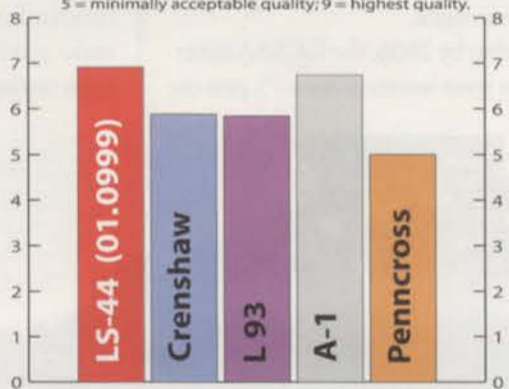
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According to a recent GCSAA survey, superintendents generally are doing more with less when it comes to irrigation – 54 percent are using less water on their golf courses than they were 10 years ago, while only 27 percent are using more. Of those using less water, almost half (39 percent) are using 1 percent to 25 percent less water than they were 10 years ago, and 14 percent said they are using between 26 percent and 50 percent less water than a decade ago.

### Ripple effect

Water restrictions influence changes in golf course design, grass type, amount of turf on the playing surface and irrigation systems. More courses in the future might have narrower fairways and browner roughs. Researchers are even working on breeding new grasses that retain color and will be more drought tolerant. However, using these new breeds would require many courses to rip up existing turf and reseed.

“As new technologies come out, we apply them,” Swanson says. “We’re on the cutting edge of water use for golf courses.”

But if a course doesn’t have access to that much water, it will have to cut back on the amount of turf it has. In Las Vegas, there’s a turf buy-back program.

“The program will pay you to sell turf so you can put in other turf that doesn’t need that much water,” Vinchesi says. “But without water you have no turf.”

Suppliers are also contributing to advancements. Dana Lonn, director of the center for advanced turf technology for The Toro Co., says the industry will move toward sprinkler heads that control smaller areas.

“There’s also a lot of work being done in the industry to enhance evapotranspiration predictions and standardize equations because a lot of irrigation is done by feel instead of science,” Lonn says.

Work also is being done on soil moisture measurement sensors that have been applied in agriculture but now are being applied in the turf industry to help superintendents decide the timing of turfgrass watering, Lonn says.

“We’re also starting to see subsurface drip irrigation,” he says. “It won’t be everywhere. It works better in sandy soils instead of clay. We’ll see more and more of it. Developments in this area are like most things – necessity is the mother of invention.”

Toro funded research that tries to understand turf and the way it uses water, as well as how to use poorer quality water on turf, which, in turn, will create a need for more

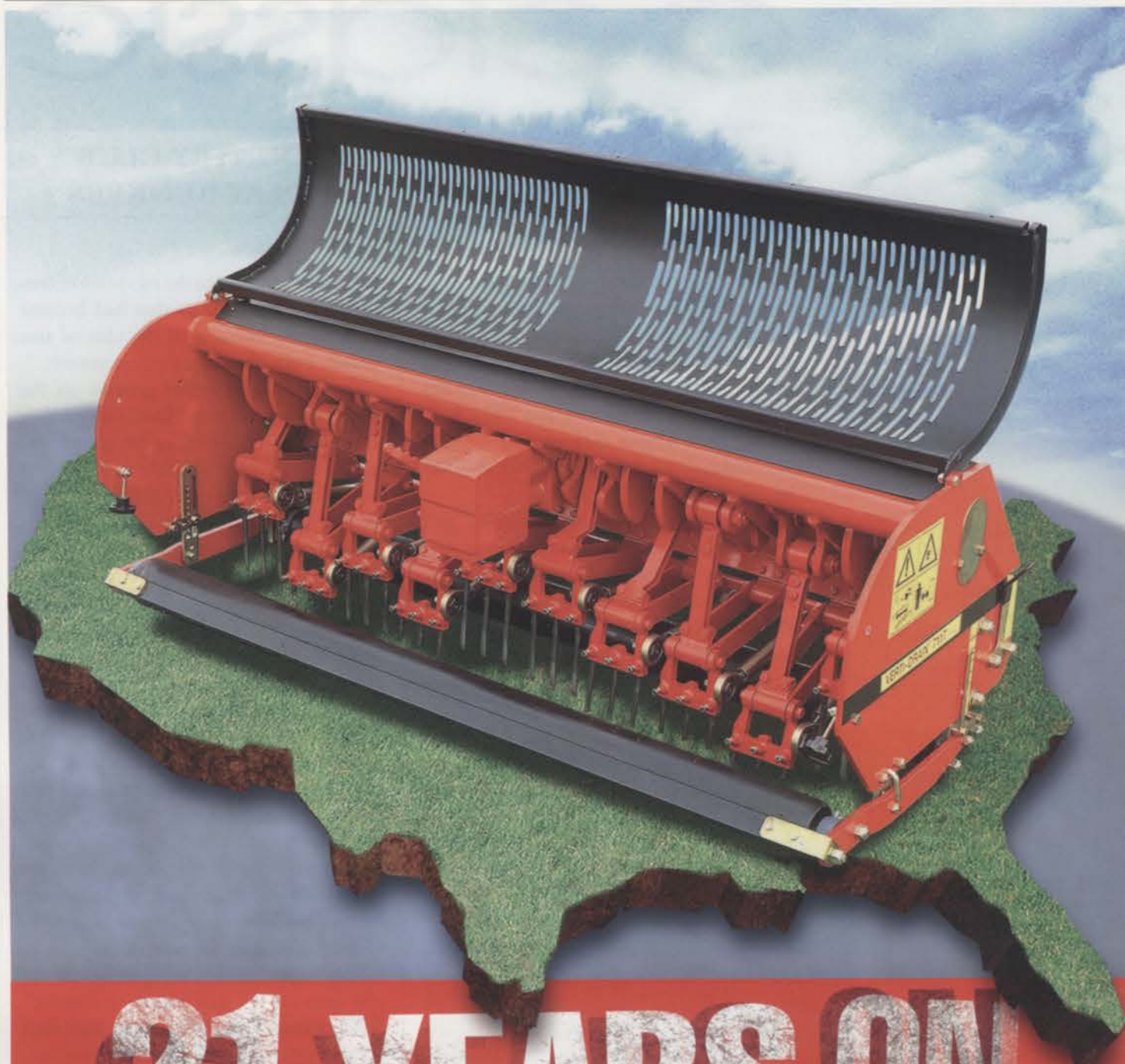
corrosion-resistant irrigation parts.

And Kiewel says Rain Bird is designing a system so that superintendents can comply with new restrictions in the Sun Belt areas.

In the end, the water-use issue will continue to be a problem because there’s a dry spell almost every year, Graves says.

“It’s not going to get any better; it’s only going to get worse,” Vinchesi says. “Many people don’t understand the pressure water use will come under.” GCN

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