



*Small beads of sweat began to collect above Pat Berger's eyebrows.*

*The sun glinted off the powdery white earth as the superintendent of the El Paso Country Club wet his index finger and touched it to the salty white Texas soil. He put the salt-covered finger to his lips and smiled and shook his head.*

*"I could scrape this stuff up and put it in my salt shaker at home," he said.*

*The water spewing out of the sprinkler head looked awfully inviting to the thirsty deliveryman. He bent down and let some of the cool liquid splash his face and roll down his throat.*

*Duane Janssen still chuckles when he tells the story of what happened next.*

*"You should've seen his face when I told him he was drinking effluent (treated sewage) water," says the Southwest Texas golf course superintendent.*

*When the unwary deliveryman found out what Janssen was watering his course with, he quickly made tracks to the nearest convenience store for a Coke.*

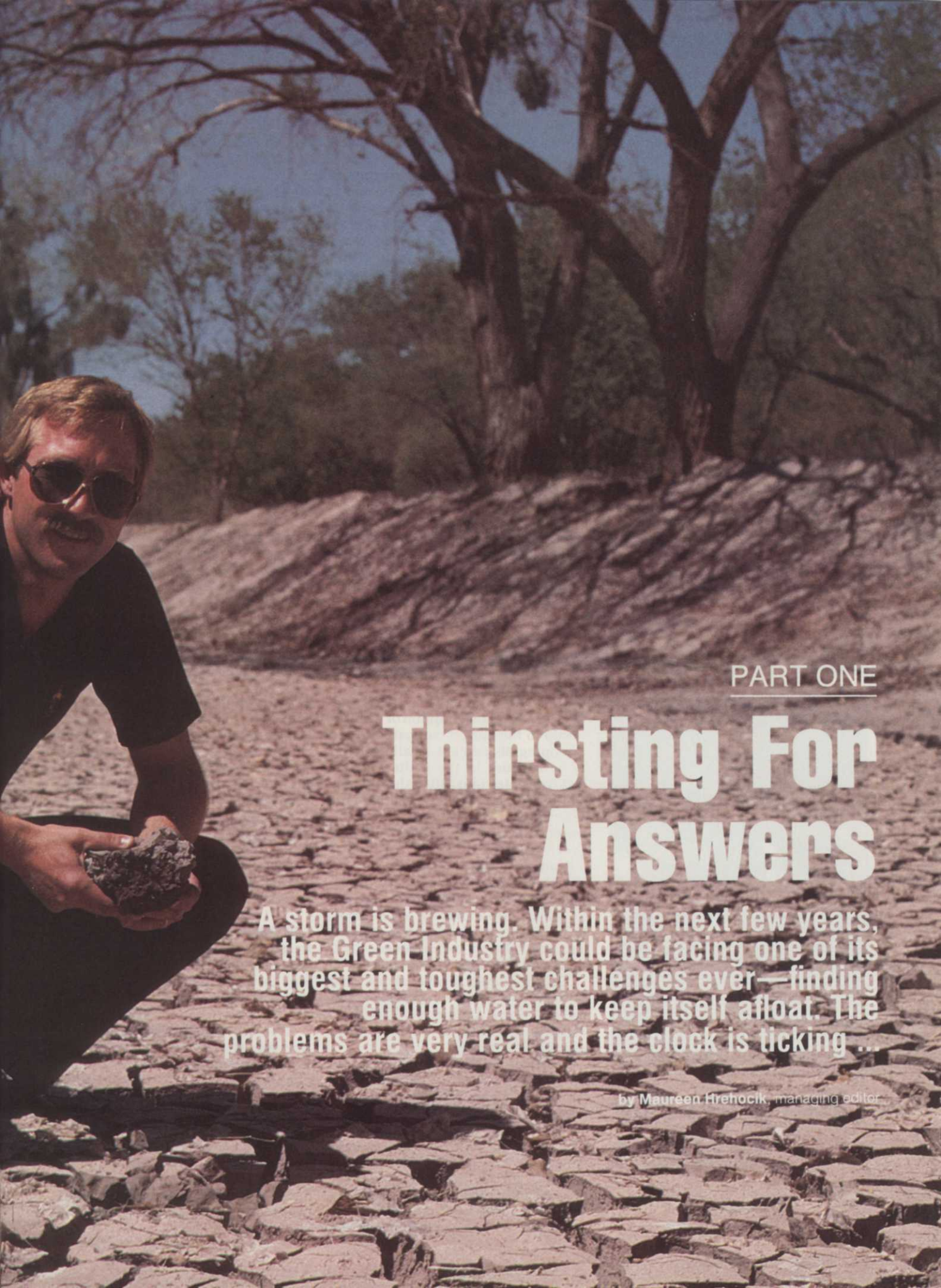
*How do you convince a client to spend an extra \$80,000 for straw mulch on a golf course in the name of water conservation? Golf course architect Michael Hurdzan was up against just that.*

*"It's sometimes hard to explain that the benefits will be realized down the road and not necessarily initially," he explained.*

*The New England club consented, though, not only to the \$80,000 for straw mulch but also to \$60,000 to divert driveways into a central retention pond to collect rainwater. The club has also adopted other water conserving practices.*

*Pat Berger, Superintendent,  
El Paso Country Club*



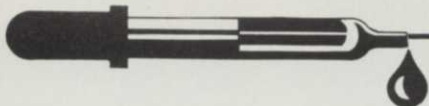


PART ONE

# Thirsting For Answers

A storm is brewing. Within the next few years, the Green Industry could be facing one of its biggest and toughest challenges ever—finding enough water to keep itself afloat. The problems are very real and the clock is ticking ...

by Maureen Hrehocik, managing editor



**S**alinity, effluent, water conserving golf course design—only three of a myriad of factors affecting a shrinking, and often-times mismanaged, resource—water.

For the multi-billion dollar Green Industry, water use, quality, quantity and conservation is the lifeblood coursing through its veins.

Golf course superintendents, landscape contractors, landscape architects, irrigation contractors and companies, seed growers, arborists, equipment manufacturers, turf associations and landscape managers are all inextricably bound together by water—and we are using it up and polluting it faster than nature can replenish and purify it.

Couple this with the ominous threat of water rates tripling, quadrupling or going even higher in the next five years and the urgency presents itself loud and clear at our doorstep.

*But are we listening?*

Slaking the thirst of urban as well as agricultural customers is becoming an increasingly important priority.

A resource that has always been available at the flick of a faucet, that has flowed with unbridled force down the nation's riverbeds and that filled the cavernous underground aquifers, is diminishing—the end result of waste, burgeoning populations and a sometimes uncooperative Mother Nature.

Aurora, Colorado, for a few years has had not only local ordinances restricting water use for lawns, but also the size of the area that can be planted in grass. Five years ago Arizona's golf courses were sucking up more than 160 million gallons of water a year.

## Enough water, but ...

The United States as a whole has adequate supplies of water. Regional and local shortages, though, are an imminent possibility.

No one can guarantee where rain will fall. No one can predict how large the snowpack will be. Nature holds all the cards and trying to predict good weather is like trying to draw to an inside straight.

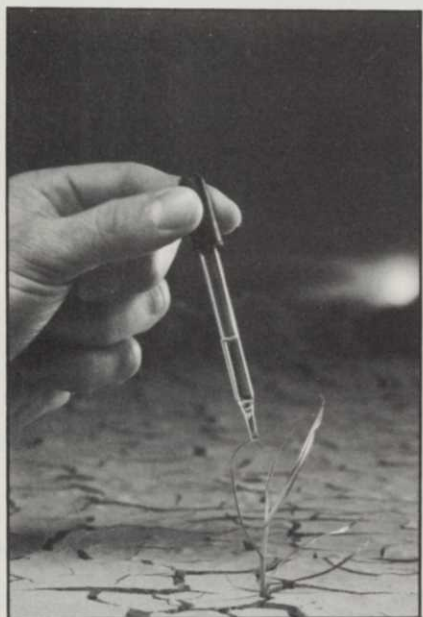
The problem, while more severe in certain areas, is by no means limited to one part of the country.

In this issue, WEEDS TREES & TURF will take a look at a few of the facets of this multi-faceted problem—salinity, use of reclaimed water, use of effluent, and golf course and landscape design in three key geographical areas where water is critical—Texas, Florida and California. (These three states alone, and Idaho, account for 25 percent of the water used nationally.)

Next month, we will look at some solutions to the water crunch through turfgrass research, concern by irrigation companies and involvement by Green Industry associations.

The overall picture, while serious, looks hopeful, mainly because of the far-sightedness of Green Industry individuals and associations. The problem, however, is by no means solved.

The greatest challenge, that of implementation and additional research, yet remains. If not met, the future of many businesses, livelihoods, recreational areas and our standard of living itself, could, literally, be slipping down the drain.



## Thirsting For Answers

**T**he flood of statistics is staggering. Human consumption of water is a drop in the bucket compared to the whopping 80 percent swallowed up by agriculture in the United States; that translates into 210 of the 450 billion gallons a day used. That 80 percent figure includes much of the water consumption needed by the Green Industry.

You've heard the figures before, but the numbers speak for themselves: It takes 3,000 gallons to irrigate a 5,000-square-foot lawn to one inch, 120 gallons to produce an egg, 300 gallons to produce a loaf of bread, 4,000 gallons to produce a pound of beef.

On the average, it takes about 1,000 gallons to produce each pound of food we eat. Even before packaging, a McDonald's Quarter Pounder takes up 1,427 gallons.

Personal activities, such as flushing the toilet, taking a bath or doing the wash accounts for about 100 gallons a day per person.

Water makes up only 1/10th of 1 percent of the earth's mass. Of that amount, less than 1/2 of 1 percent can be used for human consumption. Most of the world's water supply is locked in oceans (97 percent), polar ice caps (2.2 percent) and under-

ground water reserves too deep to tap (.3 percent).

Nationwide, we are drawing on groundwater resources at a rate of more than 30 trillion gallons every year for agricultural, industrial, municipal and domestic uses.

The Ogallala aquifer is the largest in the world, 800 miles long, 400 miles wide and is located below eight mid-western states. Its peak 650 trillion gallons of water continues to be depleted.

### Largest user

Irrigation is the largest consumptive user of water. Per day, 73 billion gallons is taken up by vegetation and transpired as vapor into the atmosphere.

The U.S. Department of the Interior reports the waste and loss of water from public and irrigation supplies is large. About 20 percent of the water withdrawn from public supplies and about 17 percent of that withdrawn for irrigation use is lost before being used, mainly through leaking pipes, mains and irrigation ditches. Altogether, such water losses in just these two categories account for an average of almost 30 billion gallons per day.

*continued on page 22*



## CALIFORNIA

# Losing a water source, but gaining reclamation momentum

**E**d Thornhill is the kind of guy who takes things in stride.

You can tell by the ease in his voice and the fact that, after 19 years with the Metropolitan Water District in Los Angeles, (most recently as principal administrative analyst), he hasn't blown his cool being in one of the hot seats in the California water situation.

Another fire, though, is brewing.

The MWD is a wholesale water supply agency, having no retail customers. "We supply water only after our customers use up their own local supplies," explains Thornhill.

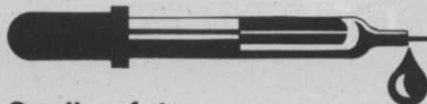
The district currently serves six counties representing 13 million people.

"We have two major supplies of water: local water which accounts for about 1/3 and imported which accounts for about 2/3. Our imported water comes to us from the Los Angeles aqueduct and that water is for Los Angeles use only. The Colorado River aqueduct is owned and operated by the MWD."

It's vying for the bounty of the Colorado River that has come into hot contention.



**Agapantha**, shown at top, is a low water use plant which is used extensively in Irvine, CA, landscapes. Ice plants, lower photo, are also used for their low water use as well as providing vivid color.



## Sealing fate

Southern California will soon be feeling the effects of a 1964 U.S. Supreme Court decision that said California's allotment from the river was too much. It, therefore, by judicial decree, will lose 662,000 acre feet to Arizona; a little more than 1/2 of what California now gets. Completion of the Central Arizona Project, a major aqueduct system, will seal the fate of that portion of Southern California's water supply. Completion of the project will take another two to three years.

"Losing the Colorado River water isn't really the problem," says Thornhill. "We've contracted with California's water project for an additional 500,000 acre feet, bringing our total from that source up to 2 million acre feet. The problem is we're one of 30 contracting for the state's supply. The state's water plant is only half complete and will take another 10 to 20 years to finish. We lose our Colorado River water in two to three years. We need to complete the state's water project faster."

Thornhill says the department knows what has to be done. It is currently working on legislation that would speed up the work.

"If we get started quickly, we'll be in good shape," said Thornhill, "but if we have a severe drought, we could be in big trouble."

The memories of the '76-'77 drought that brought parts of California to its knees is an all-too-recent reminder.

"People have a tendency to take water for granted," Thornhill theorizes. "Water in California costs less than 25 cents a ton; that's a relatively inexpensive rate."

However, the rate of apathy has escalated.

"People waste because water is cheap," Thornhill continued. "It's too bad we need a crisis before we act."

## Legitimizing a dark horse

Irvine, California, hasn't waited for any crisis to act.

This city of 120,000 in Orange County is one of the fastest growing areas in the country. It is also a pioneer in using reclaimed water for irrigation purposes. Fifty percent of its irrigation water is reclaimed. For the past seven years, a trendy city in Southern California has shown water can be used over and over again.

Masterplanned in advance as part of the Irvine Ranch General Plan 20 years ago, its planners had in mind from the beginning that Irvine would not become another urban blight on the California landscape.

The city was carefully mapped out

for controlled, systematic growth. Because Irvine is in a desert area and gets an average of 14 inches of rain a year, the big incentive to conserve is lack of groundwater. What little groundwater that's available is brackish and saline. Its other water sources are the Colorado River flowing 350 miles away and water from Northern California aqueducts.

"Reclaimed water is no longer a second class citizen," says Joyce Wegner-Gwidt of the Irvine Ranch Water District. "It has been legitimized."

That legitimization now includes 410 clients for the District, (mainly developers) using 3,500 acre feet of reclaimed irrigation water. This massive irrigation system is overseen by Matt Lovein, irrigation supervisor, planning and development, of the IRWD.

"We really had to more or less rewrite the rules and regulations concerning use of reclaimed water," says Lovein. "In the past five years water rates have doubled. In the next five years they'll probably double again."

"The way we're using reclaimed water is an energy-intensive project, but the cost will even-out in the end," he explains. "Energy is the key to a finite water supply."

## Taking the lead

Dan Heiny seemed a little out of his element. Sitting on a wooden bench in the middle of an Irvine shopping mall talking about what he does was like Picasso trying to explain how to paint a masterpiece.

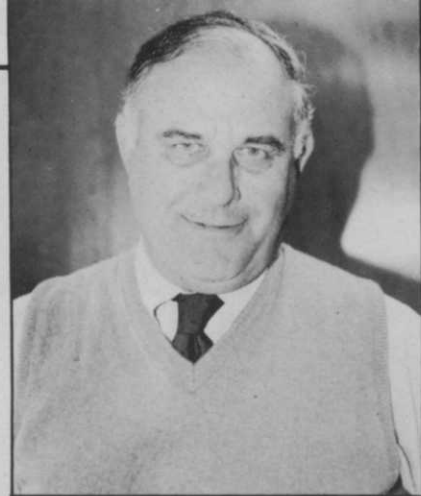
His calloused hands belie the fact he prefers to be working on-site or tinkering in his backyard "laboratory" testing new irrigation equipment.

Heiny is the landscape manager for the Irvine Co., a land planning development and management business, which is doing most of the developing of the 90,000-acre Irvine Ranch into the nation's largest master-planned urban community.

As landscape manager, Heiny is responsible for the company's commercial portfolio of 11 million square feet of commercial landscaping. Included in that are 15 apartment complexes, 34 office buildings and 11 shopping centers.

Executive Park was a different story. The 10-acre office complex was more a water managed project than a water conservation one.

"It had bad salt problems," said Heiny. "We had to apply water to flush out the root zone. We did daily tensiometer readings. We only watered when the plants told us to." He used compost to help absorb the salt.



**John Zoller**, executive director of the Northern California Golf Association

Because the complex is built on a duck pond, there was no drainage. The project had to be filled in with sand for drainage.

He installed his irrigation heads to offset runoff and also installed cement walls to support flower beds.

"This is one of our most intensive management sites," he says.

Heiny gets much of his plant material contract grown from the Tree of Life Nursery in San Juan Capistrano. The nursery specializes in low water use plant material.

"I came from Northern California and we really didn't have any water problems there," said Heiny. "When I came to Southern California, things changed. My awareness has been raised by being here." He says irrigation is his primary interest.

"I think low-volume sprays are the direction of the future. There is more direct application."

Heiny feels so strongly about it that he has thrown down the gauntlet to irrigation equipment manufacturers.

"I have a personal challenge to all irrigation equipment manufacturers. That is to develop a low-volume pop-type sprayhead. I've made my own adaptation, but it could use some refinement. There's a true need for it in the industry. We've typically gone to low volume ag systems instead of homeowner types. We need things that are more adaptable to commercial landscape. There's also a tremendous need to educate vendors to become more aware of low-volume irrigation equipment."

Heiny works extensively with landscape architects.

"Many landscape architects are not really aware of water conserving plants," he says. "Lots are in the mode of thinking they're grey-looking, when that's not the case."

Heiny's irrigation design philosophy calls for no runoff and therefore no overspray.

"That's what's forcing everything  
*continued on page 28*

**Water conserving landscaping at Bellecourt.**



**Dan Heiny of the Irvine Company and Joyce Wegner-Gwidt of the Irvine Ranch Water District discuss a site.**



**WATER** from page 24

to change," he says. "We have to hit the pocketbook before people really sit up and take notice. Projects going in now are extremely well-designed irrigation-wise. We design for long-term management to reduce labor and maintenance costs."

An example of that is Heiny's use of spring-retractable pop heads, not solid set risers.

"They are inflexible. If one gets broken, the cost of repairing it is more expensive than installing the spring-retractable kind."

"The future is very exciting. Within the next two years, the Irvine Co. will be an absolute leader in water conservation. We have the awareness, knowledge and control aspect."

**Northern California**

John Zoller's office overlooks the putting green at Spyglass Hill in Pebble Beach.

Looking out the window at the lush seaside bent and poa green, it's hard to imagine this mecca of golfdom has ever felt the searing fingers of a drought.

But it has.

And people remember.

Zoller, for the past five years, has been executive director of the Northern California Golf Association. Its membership includes 293 clubs and 141 associate clubs representing

80,000 individual members.

"During the drought of '76-'77, outside irrigation was banned," he recalls. "We begged and got enough to water the greens only."

"During that time, the weather was so good the droughty conditions didn't deter golfers. In fact, it increased play."

Superintendents had to contend with this increase in play while being able to do less maintenance.

"If we hadn't been able to keep the greens up, we would have been in real trouble," says Zoller.

Add to that the fact that the five courses which lie in the confines of the Del Monte Forest—Pebble Beach, Spyglass Hill, Cypress, Dunes and the Shore at Monterey Country Club—are more than just expensive playgrounds. They provide jobs for much of the population living in the Carmel/Monterey area. If golf courses aren't up to par, people don't golf and don't fill the hotels and eat the food and indulge in the other amenities of the area.

**Silver lining**

In one sense, the drought was good, Zoller maintains, because it improved everyone's irrigation attitude and practices.

"Our problem here exists on a year-to-year basis," explains Zoller. "If we go through one winter that's bad, we're in trouble."

The Del Monte Forest area gets no natural rainfall from the end of March to the 1st of December and only 15 inches a year total. Many courses have stopped irrigating the area between the tee and where the fairway begins to save water, according to Zoller. With as much of an "inconvenience" as the dry weather was, Zoller said it wasn't quite as severe in the Pebble Beach area as it was in the Monterey Valley.

Water rates are also becoming a problem. They've tripled and quadrupled over the last five years. A course that used to cost \$12,000 to irrigate for a year, now costs \$60,000.

For Zoller, the bottom line, in most cases, is over-irrigation.

"Over irrigating courses is one of the primary ways we are misusing a limited resource. It also encourages weeds. What the question really boils down to is aesthetics vs. playability. I don't see anything wrong with having natural areas in a course. You don't need 160 park-like acres when you only play the game on 40."

In the Del Monte Forest area, there is no groundwater available. It is completely at the mercy of the local water company or using reclaimed water. And this area is where Zoller feels the future of the industry lies.

In fact, he thinks California is moving toward using only reclaimed water for any sport turf, rights-of-way, cemeteries and other landscape-related uses.

"We already have a moratorium on drilling wells and a well tax," he said.

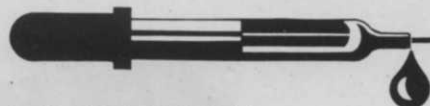
In 1979, there were about 58 courses in the state that were using reclaimed water. Now, Zoller estimates that number to have climbed to 75. The real stumbling block is the federal government which hasn't come through with any funding for setting up reclamation plants.

The NCGA is putting its money—and effort—where its mouth is.

It has been funding the Turfgrass Adaptive Research Program at the University of California, Davis, for the past 17 years, this year to the tune of \$40,000. The program, under Bill Davis, is primarily aimed at finding low water use turfgrasses.

"Along with the USGA, we must support development of drought-resistant turfgrass varieties. Research and use of reclaimed water are two of the most important things we can be doing."

The TARP program is also doing research on putting greens, various types of sand to use on courses, and compaction tests on bentgrass. All five courses in Pebble Beach have seaside bent and poa greens and Highland bentgrass tees and fairways.



## FLORIDA

# Water, water everywhere, but quality is poor

**F**lorida is a microcosm of different water problems.

The pounding Atlantic on the coast brings with it salt intrusion problems. In the western part of the state, where the water table is high, there is impervious rock and drying winds which cause defoliation. The rest of the state has well-drained soils, but water high in total dissolved solids.

Water is abundant in Florida. The problem is quality and a sufficient potable supply.

Because of the state's sand soil, chemical leaching into the groundwater supply has fathered such controversial issues as EDBs leaching from citrus groves into the groundwater. The nutrient-holding properties of sand are also not good, allowing nutrients to leach out. Fortunately, because of the amount of rainfall, salt build up is flushed away. In South Florida, the soil itself has some phosphorous but doesn't move in the soil. Nitrogen and potassium have to be added on a regular basis. The water table is also at four feet, which causes the soil to dry from the top down.

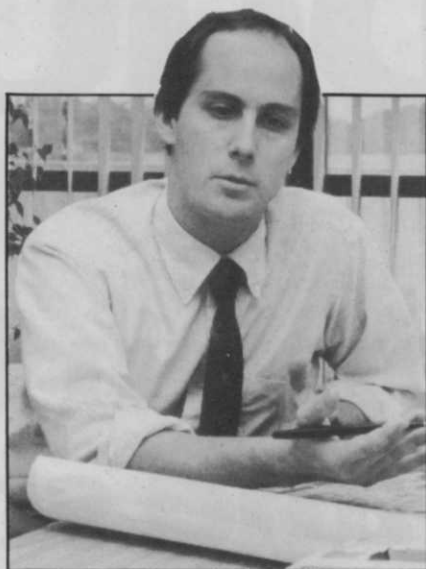
In South Florida, water for irrigation uses comes from city water supplies and pond or canal water. Its aquifer is porous and exposed to the surface.

The northern part of the state is supplied by an aquifer in another state.

Dr. Bruce Augustin of the Institute of Food and Agricultural Sciences, University of Florida, Ft. Lauderdale, says the state has great potential to use effluent, but the local health officer is the major stumbling block.

"There has been such a panic created by other incidents in the past," he says. "It's an unfortunate situation because our effluent is relatively clean. There's no heavy industry and therefore no heavy metal contamination. Effluent is also an unrestricted water supply."

Augustin said effluent use is more predominant in the Orlando and St. Petersburg areas.



Landscape architect Matt Mathes

The Palm Beach County Utilities and Engineering Dept. is currently studying effluent disposal and water reuse for eight golf courses in the south county area, as well as for lake recharge.

### Changing attitudes

Matt Mathes, a landscape architect with the largest architectural, engineering and planning firm in Florida, Reynolds, Smith and Hills, agrees that effluent use still carries the albatross of "smelly sewer water."

"I think the problem with effluent use is twofold," explains Mathes. "For one thing, there is a real fear of contamination from the source. The second thing is inertia; because it's a relatively new idea, it's hard to accept. The commercial and public client should be leaders in this movement to get it to a more acceptable level."

There's also a cost factor involved. When effluent is being used, dual water mains have to be installed—one for the effluent and one for potable water—and that translates into more cost.

In Boca Raton, Florida, an affluent city in South Florida between Ft. Lauderdale and West Palm Beach, the

city's Community Appearance Committee has enacted an ordinance prohibiting staining of concrete from irrigation spray. Because South Florida water is so high in mineral content, if irrigation spray is directed toward buildings and sidewalks, an iron-colored stain is left on the cement.

Taking in the whole water picture of South Florida, Mathes commented, "Maybe our sense of aesthetics must change. Cities can demand too much. Maybe instead of putting use restrictions on certain types of water, we should make brown concrete."

Mathes' point is well-taken. Changing attitudes, whether it be concerning the social acceptability of effluents, the aesthetic appeal of buildings or water usage policies at the local, state and federal levels, seem to be another thread weaving its way through this complicated tapestry.

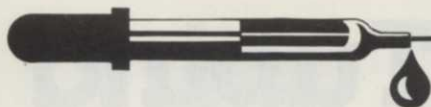
The competition among Florida's cities to lure prospective residents is intensifying. The general trend has been toward "good-looking" cities with many of them modeling themselves after Boca Raton.

Another water source, lakes, opens up a whole new area of problems—the biological realm. The myriad number of organisms that can spawn and infest plants once the water is applied is mind-boggling. This irrigation source, however, is prevalent among residents. In fact, according to Mathes, it's their number one choice, when available, for irrigation use.

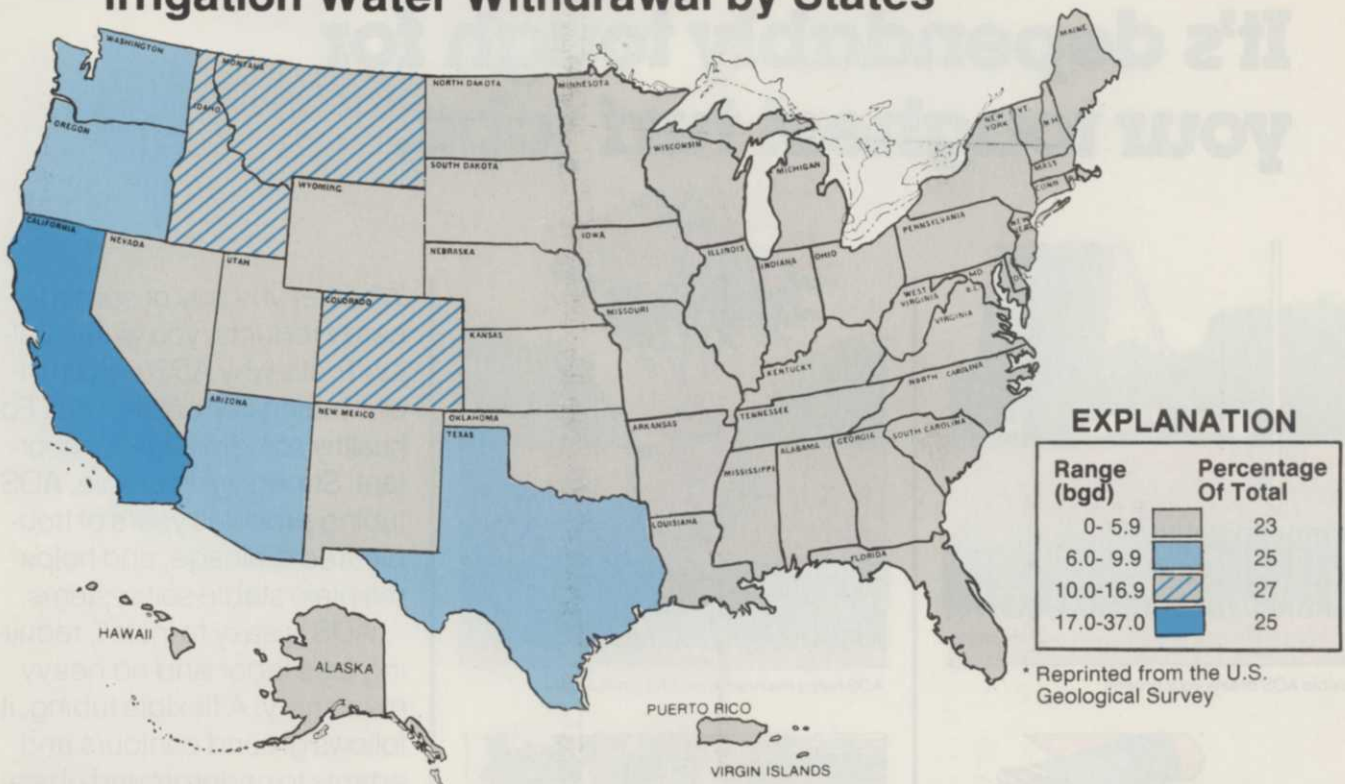
"There's a lot of apathy to contend with out there," he says. "There have been signs of an increased awareness, though, in water conservation. People are making more intelligent decisions."

Because Mathes has felt this awareness, he, personally is in Florida and not Texas or California.

"There's an opportunity here to build patterns of living in new and better ways. All the emerging patterns are here."



## Irrigation Water Withdrawal by States\*



### TEXAS

# Salt and supply make water problems as big as the state itself

**T**exas is another Pandora's box of water problems.

More pressing is the issue of having enough water. Some suggestions for bridging that problem have been a little grandiose—such as building a canal from the Mississippi River to the high plains of Texas, or pumping water from Canada to replenish dwindling Texas aquifers. Sodium problems are also at the top of the list, especially in the El Paso, Midland, Odessa and Lubbock areas.

Texas has also had to bear a phenomenal increase in growth over the past 10 years, adding another burden to an overtaxed water supply.

One barometer of that growth is the 18,000-acre Dallas/Ft. Worth Airport, the sixth busiest airport in the world.

Jim Dalby is the utilities service coordinator for DFW airport.

"We're doing everything we can to

save water," says Dalby, sitting in his office in the utilities building, a sort of "mission control center" for the airport water operations.

Not far from his office is the central utility plant computer console which keeps tabs on every drop of the nine to 10 million gallons of water used a day by the different functions of the airport. The monster computer terminal can even monitor the depth and flow of the 320-acre-foot Trigg Lake, the airport's major runoff collection reservoir.

"With all the new construction here, we're looking for new ways to impound water with the help of the U.S. Geological Survey," he said.

There are currently five runways with a sixth under construction.

Currently, the Department of Water Resources allows the airport to impound 108 to 120 million gallons of water. With the increasing water de-

mands, the department is petitioning the DWR to impound more because all the concrete in the airport makes the runoff rate much higher.

The runoff water that is collected in Trigg Lake provides the one million gallons a day need to irrigate Bearcreek Golf Course at the Amfac Hotel at the airport's south end. The north end of the airport is slated to get a lake for impounding, but currently uses potable water for irrigation. That water is supplied from Dallas and Ft. Worth.

Dalby and his associates have also been seriously looking at using effluent from industrial waste.

"The more we can reuse, take from the ground and use from Mother Nature, the cheaper it will be for the cities," Dalby said.

In his 11 years with the airport, Dalby has seen "amazing changes."

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## Wheat from chaff

Texas has one of the most advanced irrigation licensing laws of its kind in the country.

In 1973, the law, a joint effort of the Texas Turf Irrigation Association and the Texas Board of Landscape Irrigators and under the Department of Water Resources, went into effect. It deals solely with landscape irrigation, and according to Charles Putnam, president-elect of the Irrigation Association, protects the consumer and supply of potable water.

Part of the licensing procedure involves taking a test; part of the test is designing an irrigation system which is graded. The licensing board is aware of water conserving aspects and looks for them on the systems being graded.

Putnam reports that about half of the 900 who take the test a year, pass.

John Heidman, president of Irritech Corp., one of the largest irrigation consulting companies in the country and past president of the Texas Turf Irrigation Association, says half of his fees as an irrigation consultant are in compensation for suggesting a water source for his clients.

"It's important to get water that has not gone through an expensive purification process," said Heidman.

With that in mind, Heidman is working on getting a grant to document a situation he sees repeatedly in Dallas.

There is a 26-story office building in downtown Dallas, one of the hundreds of monolithic goliath's vying for

the city's water and energy supplies. It uses 100,000 gallons of water per day for its 2,600 tons of air conditioning. Evaporation takes 60,000 gallons. The other 40,000 gallons, because it has gone through the air-conditioning system, has been chemically treated and not suitable for reintegration into the city water supply.

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**And then there's the wind. It blows so hard at times, it kicks up enough dust to cause motorists to drive with their lights on in the middle of the day, just to get through the mirky brown/red shroud.**

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"The city water supply bears the brunt of getting the chemicals out of the water," says Heidman. "What we need is a system for recouping water from high rise buildings and processing it, say, at smaller sewage treatment plants to take the burden, and cost, away from the city."

## El Paso problems

El Paso, a southwest Texas city of a half million people, sits in the desert in the shadow of the Franklin Mountains and on the border of Mexico.

Two problems haunt El Paso — salt and the wind.

Eighty percent of the city's water comes from underground aquifers, the other 20 percent from the Rio Grande River. Aquifer recharge is slow because of the high demands put on them. The salinity content of the water is 1/2 that of seawater. Municipal water contains the least, 400 parts per million.

In the summer, 2.8 times more water is used than in the winter. As the water is used up, lower quality water is left. The annual precipitation rate is only seven inches.

And then there's the wind.

It blows so hard at times it kicks up enough dust to cause motorists to drive with their lights on in the middle of the day just to get through the mirky brown/red shroud. It also boosts the evaporation rate up to as much as two inches a week and erodes soil.

The city, though, if nature cooperates, is getting by. The Water Utilities Public Service Board is also trying to ensure its water supply.

Hugh Hickerson, general manager of the WUPSB, said the city is involved in litigation with New Mexico to try to get more groundwater from that state.

"They (New Mexico) have seven to 10 times the amount of good water El Paso has," Hickerson explained, "but because of a New Mexico state statute, we cannot use any."

The board is also building a \$30 million purification plant that, according to Hickerson, will get effluent to "drinking water quality." By the time the plant is completed in early 1985, the residents of El Paso will be drinking treated sewage water.

The Water Utilities Board has also instituted a program among homeowners for using low-water use, native plant materials. Currently 15,000 single family homes are using this type of plant material.

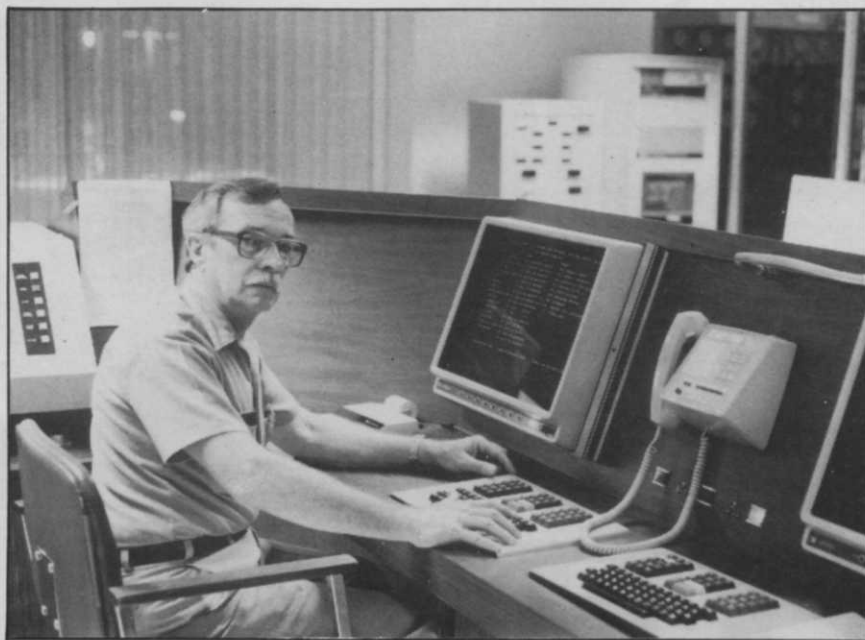
## Desalting an institution

Pat Berger has another type of problem—sodium; not on his lawn, but on the 79-year-old El Paso Country Club.

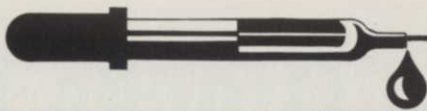
Rings of salt left from well water dot areas of the course and deposit themselves on the sides of creek beds. The 31-year-old superintendent has his hands full with the 120-acre course. He taps his foot with nervous energy against his metal desk in the maintenance office as he talks about beginning a \$1.2 million renovation program, scheduled to be completed in 1986 or '87.

## A unique situation

Having worked in Arkansas and New York, Berger characterizes the El Paso area as, "like no other place I've been.



Jim Dalby, utilities service coordinator for the Dallas-Ft. Worth airport.



What doesn't get watered here doesn't grow."

"Our temperatures can fluctuate 40 degrees between evening and morning," he says. "But sodium is our biggest problem."

There's also a heavy amount of calcium build-up effecting the rate of change of the soil's Ph factor, according to Berger. The Ph range is high (8 to 9).

Berger has a systematic plan for the renovation which includes getting the grass developed first — greens, tees and fairways. His course is predominantly bermudagrass with bentgrass greens.

Another priority is installing a new, \$650,000 irrigation system which will pump 781,000 gallons a night. His water supply is stored in four storage lakes.

"We waste no energy getting water," he said. "We pump right into the system."

Currently, Berger has a quick-coupler system with water supplied from the Rio Grande and the city water sys-

**Salt deposited** along the sides of a trench at El Paso Country Club.

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tem. The club's water allocation from the Rio Grande lasts about seven months. It is quality water, but some weed seeds do filter in. The sodium, level, however, is acceptable. In the winter, he uses well water which contains more salt. The Rio Grande supply depends on the Colorado and New Mexico snowpack melt.

"If Mother Nature is good to us, we get a bountiful supply."

Berger said his present irrigation system is more like a homeowner system. "Our new one will be solid state," he explained. "It will eliminate 90 percent of our current irrigation problems."

Another 20-acre foot lake will be built to increase storage capacity because water is not always available when you may need it. It is being built close to the pump house to be more energy efficient. Another lake will be doubled in size. Berger plans on taking out half of some large cottonwood trees planted by one of his predecessors along one of the lake's edge.

"We'll save about 250 gallons of water per tree. The golfers will still have a canopy and I'll be able to develop specimen trees and get the added water benefit."

There's not much Berger can do

about eliminating the wind.

"From mid-February to mid-May we have very windy weather. We built three greens in-house and the first day we seeded, we had 70 mph Santa Ana winds. It was terrible."

With the wind, as much as 1/32nd of the soil surface can be lost.

Because of the wind, Berger said having a more natural golf course to save water needed by trees and turf is impossible.

"The sand blowing would cause golfers to have to wear goggles," he claims. "It would become an unplayable situation." **WT&T**

**Next month: Part II—Thirsting for Answers...the Solutions.** The water situation can be turned around with increased research into low water use turfgrasses and ornamentals, Green Industry Association involvement and more efficient equipment from irrigation companies. Next month, WEEDS TREES & TURF will explore those areas in the second and final part of "Thirsting for Answers."

*(Editor's note: Special thanks to Ed Portmann, Portmann Communications, Inc., Irvine, CA; Cindy Martin, City of Boca Raton, FL; and Dr. Ricks Pluenneke, The Plant Pro, Ft. Worth, TX.*

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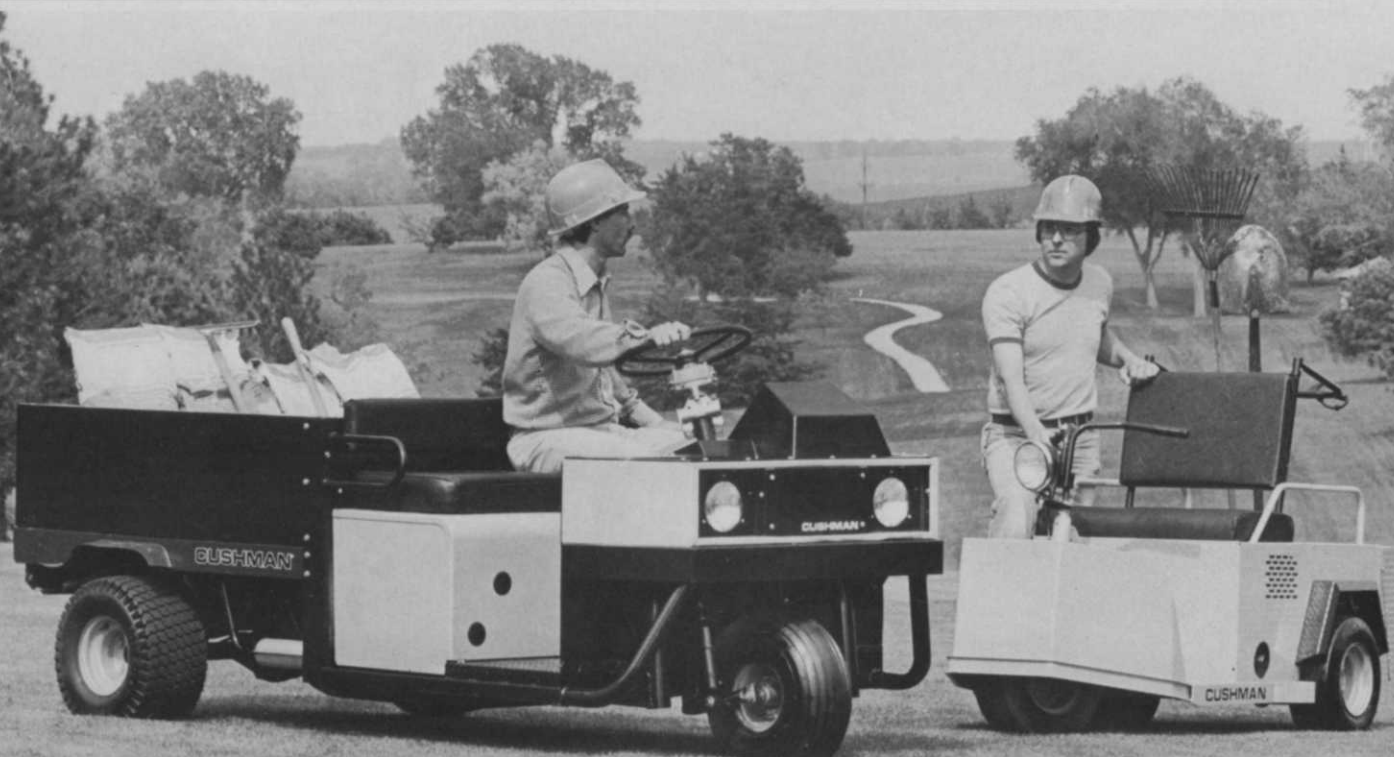
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