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An Irrigation Gold Mine

THE WAVE of the future? It's the spray of water from underground irrigation systems that automatically sprinkle hundreds of residential lawns throughout Palm Beach County, according to Jack Kouns.

Kouns is president of Jack Kouns, Inc., one of the most successful residential irrigation contractors in the country. He believes his marketplace — Florida's east coast — is the forerunner of the boom in the irrigation industry that officials have been predicting for the nationwide homelawn irrigation market.

"What we're experiencing here is similar to the early years of the television boom," Kouns said.

"We don't have to sell the concept of a time-saving, money-saving irrigation system for a home lawn. Everybody wants it. We concentrate on selling our products and service as the best available."

He continued: "We operate in an area of affluent homeowners whose lawns must be watered 52 weeks of the year. Most of them either don't want to — or can't — spend the time and energy to do it manually. Additionally, the high cost of water here makes everyone conscious of the need to use it efficiently.

"All of these conditions add up to a growth market for residential irrigation systems. While they do not apply with the same intensity everywhere in the country, the differences are only a matter of degree."

Kouns got into the irrigation business quite by accident. He moved to Florida in 1957 after selling his interest in a company that manufactured steel scaffolding in Missouri. "I was looking around for something to get into and ran into a fellow who had a small irrigation business he wanted to sell," he said.

The company had two full-time employees. Now it has 40, a fleet of 25 trucks and a modern office and warehouse facility in West Palm Beach.

"For the first several years we were like everyone else in the business: selling manual systems with plastic pipe. Our business started to grow dramatically when we got into automatic controllers," Kouns said.

The big breakthrough came, he said, with the availability of automatic variable timing when the Irrigation Division of The Toro Company (then Moist-O-Matic) introduced the first of its Monitor series of controllers.

He's been using Toro irrigation equipment ever since.

Before the development of automatic variable-time controllers, he explained, most people felt an underground irrigation system was practical only if they could draw the water from a well. "They reasoned that if they were on municipal water, their water bill would be horrendous, especially if they forgot to turn it off," he said.

Most of the company's installations today, he said, are connected to municipal water systems. "With automatic variable-time controllers, the amount of water — and the water bill — can be governed precisely and varied according to weather conditions."

Kouns reported that until about a year ago, the cost for a residential system kept dropping steadily. "Inflation changed that. But we're still able to provide a system with better performance for less money than 15 years ago."

Although the effects of inflation are uncertain for the future, Kouns said, he expects other technological breakthroughs for irrigation equipment will help keep costs reasonable and expand the market for residential systems.

Kouns has been planning for several years to establish branch operations elsewhere on the east coast of Florida. "We've been growing so fast here, we have not been able to spare any of our experienced people for a branch office," he explained.

But his three sons, all of whom work with him — Andy, in the company's well drilling operations; Cam, in irrigation sales; and Todd, in installation and service — are expecting to help implement the expansion plans.

Kouns was born and raised in Huntington, W. Va. He received his B.S. degree in aeronautical engineering from Georgia Tech in 1943 and a master's there in 1947 after serving as a commissioned officer in the U.S. Navy.

Before moving to Florida, he worked mainly in engineering — for a chemical company, a concrete block manufacturer and manufacturers of scaffolding and folding bleachers in Charleston; Detroit; Warren, Ohio and St. Louis.

Although he eschews a philosophical approach to the advantages of automatic irrigation for water conservation and environmental improvement, he made this observation:

"Unless we want to get covered over with concrete, with people living wall-to-wall, we must have green spaces. We need the beauty of growing things and their help in keeping down noise and air pollution. and we must learn to use wisely our finite natural resources, including water, even where it seems to be plentiful. Modern underground irrigation systems offer the best available technology for water management for maintaining our urban and suburban green spaces."

1975 State Pesticide Leaders

Final publication of State Plans for Certification of Applicators was made on March 12, 1975 in the Federal Registrar. The job is now up to each state to submit plans and proceed with certification of all applicators. Unless a farm operation is involved, you will be certified as a "commercial applicator."

Your state is probably working on certification right now. Some state fees are high (up to $60 yearly) and some states take a tough stance. And this makes reciprocity with other states rather difficult.

You should be aware of developments in your state. A list of state leaders is provided for your information. Contact them for further details or status of legislation and certification plans in your state.

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(Continued on page 54)

Meeting Dates

Western Chapter, ISTC, 42nd annual meeting, Riviera Hotel and Country Club, Palm Springs, Calif., May 11-14.

Florida Nurserymen and Growers Association, 1975 convention, Innisbrook Resort and Golf Club, Tarpon Springs, Fla., May 22-24.

Turfgrass Field Days and Trade Show, Virginia Polytechnic Institute and State University, Blacksburg, Va., June 18-19.

Michigan Turfgrass Field Day, Crop Science Field Lab, Michigan State University, East Lansing, Mich., June 24.

The Hyacinth Control Society, Inc., 1975 meeting, Hilton Palacio Del Rio Hotel, San Antonio, Tex., July 6-9.

Shade Tree Day, Ohio Agricultural Research and Development Center, Wooster, Ohio, July 9.

American Sod Producers Association, summer convention and demonstrations, Crown Center, Kansas City, Mo., July 17-18.

American Association of Nurserymen, centennial convention, The Palmer House, Chicago, Ill., July 19-23.

Horticulture Research Institute, New Horizons Day '75, The Palmer House, Chicago, Ill., July 23.

Penn Allied Nursery Trade Show, Hershey Motor Lodge and Convention Center, Hershey, Pa., July 29-31.

Turfgrass Field Day, The Ohio State University, turfgrass research plots, Columbus, Ohio, July 31.

Southern Nurserymen's Association, annual convention, Atlanta, Ga., Aug. 3-5.

Illinois Landscape Contractors Association, Summer Field Day, Burr Oak Nursery, Round Lake, Ill., Aug. 6.

Garden Industry of America Market, Las Vegas Convention Hall, Las Vegas, Nev., Aug. 8-12.

Canadian Parks and Recreation Association, annual conference, Quebec City, Aug. 10-14.

International Shade Tree Conference, 51st annual meeting, Heritage Hotel, Detroit, Mich., Aug. 10-14.

Illinois Turfgrass Foundation, Golf Day, Indian Lakes Country Club, Bloomingdale, Ill., Aug. 25.

Turf and Landscape Day, Ohio Agricultural Research and Development Center, Wooster, Ohio, Sept. 9.

Pacific Horticultural Trade Show, San Diego Convention Center, San Diego, Calif., Sept. 13-15.

International Symposium on Environmental Monitoring, Frontier Hotel, Las Vegas, Nev., Sept. 14-19.

Illinois Turfgrass Foundation, Inc., 1975 Field Day and Open House, University of Illinois, Urbana, Ill., Sept. 16.

PROTECTING *(from page 39)*

satisfactory or efficient on one might be entirely wrong on another. For the most part, manufacturers are generally committed to one approach, which they make fit each project, whether or not a more economical or other alternative is possible.

Too much designing is motivated by cost alone. What the industry fails to recognize is that a healthy profit can be realized, at the same time rendering a useful and competent service to the consumer. Until prejudiced direction is eliminated, this plague of inadequacies will continue. Perhaps the consumer will wise up and learn that retaining an independent consultant to look out for his best interests will assist in avoiding waste and confusion. The golf course architect should also be scrutinized. In many cases, he does not possess the ability or does not wish to perform the irrigation design in-office, and instead relies on the manufacturer to supply him with drawings and specifications. The same problem can result here as with the supplier, contractor or manufacturer; once again, the allegiance of the individual is in jeopardy, for the service is more than likely not being rendered in the consumer's best interest.

It is not uncommon that the golf course architect, although acknowledging the need for irrigation, is not overly concerned with this aspect. He might be very capable of producing a good golf course layout, but he often gives little concern to the irrigation, other than the potential fee it brings, he therefore relies heavily on the manufacturer or contractor to see that some sort of system is supplied. The contractor is potentially more aware of the inadequacies than any other individuals involved, but for fear of not being allowed to bid on future projects by the golf course architect, he has a tendency to cover up errors in the design. Result, the golf course architect no longer has control over the contractor.

Covering one mistake involving a few hundred dollars could eventuate a cost to the consumer of thousands of dollars on some portion of the installation not properly performed or completed. It is imperative that an independent relationship exist between the professional and the contractor, as well as no alliance between the consultant and the manufacturer.

Another dangerous situation is the "turnkey" operation. This sounds attractive from the consumer's standpoint, because he designates total responsibility for the irrigation system to the contractor; unfortunately, few contractors are capable of rendering such a range of services. Somewhere along the line in planning, the criteria must be clearly established. The owner can also fail to receive competitive bidding on the project and this results in not only an inefficient tool, but also too high a cost.

It seems obvious that the only way the irrigation system can be the preventive maintenance tool intended, at an economical cost, is with the guidance of an individual who is not only knowledgeable but who receives no remuneration from anyone but the client. The only extra benefit he can receive is the con-

sumer's future recommendation for a job well done.

On most projects, particularly golf courses, the emphasis is on the esthetic qualities and the main function of the course; the concern over irrigation is solely how much it will cost. Far more is involved in the irrigation than is apparent. However, when the time comes to maintain the course, all of the shortcomings are obvious but it is generally too late and only through large expenditures, or in some cases a complete re-do, can the system be made acceptable as to operation and operating costs.

A sprinkler system has many facets. It is the only entity, outside of the primary function of the project, that affords a return on the investment. It should be thoroughly investigated from all standpoints. The materials used should be of high quality to insure years of satisfactory service. The ease and method of operation, conserving water as well as manpower, should be carefully considered. Maintenance saving features, such as a system to inject fertilizer at the same time the system disburses water, should be considered.

The sprinkler system is not like trees and turf — it can't grow. If not properly executed initially, it is very, very difficult (if not impossible) to correct an inadequate installation. You can always plant a few more trees, but if an inadequate number of sprinklers have been installed, additional heads cannot be simply tacked on. The time for preparation and planning is initially. Even if the consumer recognizes the need for an irrigation consultant, he is still faced with a very difficult decision. Many consultants depend on manufacturer recommendations, and to obtain such recommendations, will owe their allegiance to the manufacturer and will specify his products whether or not they feel the product is truly right for the project.

This is difficult to ascertain. However, applicants should be screened thoroughly. Above all, the resume of the consultant should not be trusted to the point that only the individuals or projects indicated as references are checked. A more accurate picture can be obtained by checking at random with some local contractors and asking their opinion of the consultant. They are knowledgeable and will generally have

worked with the consultant's designs on several occasions. The contractor knows whether the consultant is affiliated with any manufacturers, and whether he is competent.

The client must realize that he is dealing with a close knit group of individuals; the personalities, favoritism or dependence upon each other can be used to the client's disadvantage. I have witnessed situations where a client has checked on a reference of a consultant, and the person in charge of the project (for fear of looking ridiculous) will give a favorable comment on a system that is actually a failure.

The consumer's only salvation is, after exhaustive selection procedures, to establish a complete list of requirements. The irrigation consultant should be bonded for an amount proportionate to the cost of the project being undertaken. The criteria should be established through plans and specifications. Upon obtaining a contractor, he should also be bonded accordingly. After completing the project satisfactorily, a maintenance bond covering a period of two years in the amount of 20 percent of the total cost of construction should be filed. It is often true that even though a guarantee on materials and workmanship exists, this guarantee cannot be exercised because the individual or company is no longer in business.

These measures involve only a relatively small cost expenditure. Due to the fact that the majority of the sprinkler systems are approved through a group or board of directors composed of individuals not necessarily knowledgeable in this area, it is in their best interests to retain a responsible individual to insure that their selection will result in a good installation and who will be fully responsible for any actions in this regard.

The simple do's and don'ts to protect the investment in an irrigation system can be summarized as follows: Don't accept a design from a manufacturer, supplier or contractor, free or otherwise. Don't accept drawings from a manufacturer, supplier or contractor indicated to have been done by an independent consultant. Don't lower the quality of the system to meet the present budget. Do program and phase the project in the event the total funds required are not available immediately. Do investigate thoroughly and select an independent consultant. Do bond this independent consultant. Do bond the contractor selected. Do establish a maintenance contract bond after completion of the installation.

There is an old expression which says "Too Much Or Too Little". There is hardly anything in the world that some man cannot make a little worse and sell a little cheaper. The people who consider price only are this man's lawful prey. It is unwise to pay too much, but it is worse to pay too little. When you pay too much, all you lose is a little money. But when you pay too little, you sometimes lose everything, because the thing you bought is incapable of doing the task it was bought to do. The common law of business prohibits paying a little and getting a lot. It can't be done. □

SUBIRRIGATION *(from page 22)*

Additional nitrogen was applied to the subirrigation water during the latter part of July and throughout August to promote greener color. This increase in nitrogen fertilization resulted in a two-fold increase in soil nitrogen levels. However, a nitrogen response resulting in greener turf failed to occur until temperatures became cooler in late September and October.

Total utilization of applied nitrogen was extremely poor for the subirrigated treatments. This inefficient use of nitrogen was believed to be related to the anaerobic conditions associated with the subirrigation treatments combined with the effects of high summer temperature. Denitrification or accumulation of toxic substances are possible factors contributing to this situation. This problem of nitrogen chlorosis has not been reported to occur on subirrigated bentgrass grown in cool climates and may be of concern only during prolonged hot weather.

Summary

Subirrigation of turf provides a

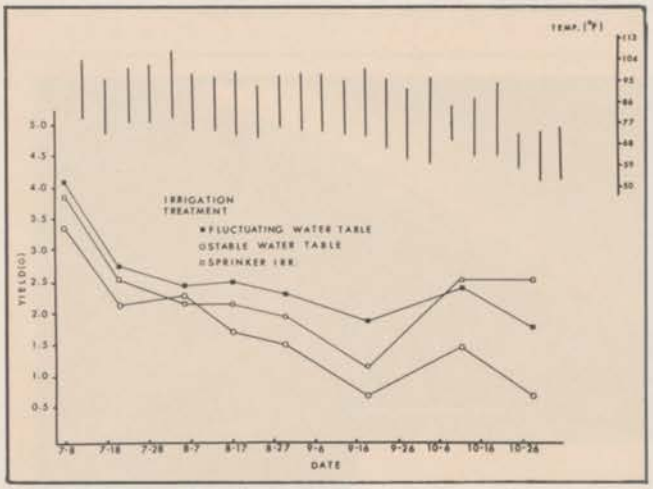

Figure 1: Effect of irrigation treatment and temperature on the yield of bentgrass.

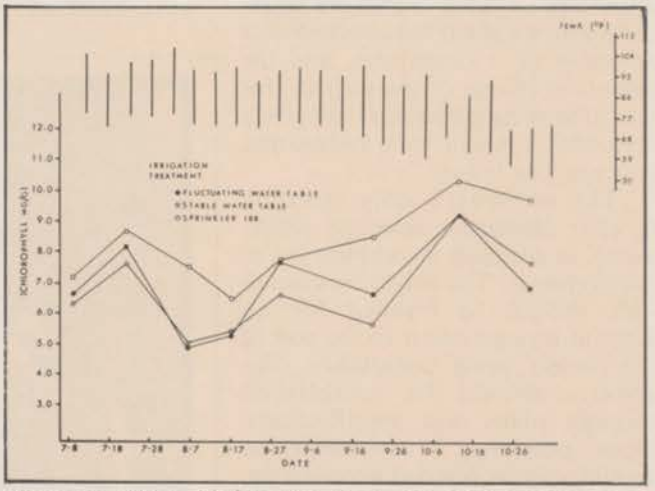

Figure 2: Effect of irrigation treatment and temperature on chlorophyll content of bentgrass.

means for improving irrigation efficiency and effectiveness. The main turf response to subirrigation is that of improved root development. This response is especially significant to the survival of cool-season turf grown during prolonged heat stress. The additional root mass increases the soil volume from which water may be obtained, thus lessening the incidence of drought and need for syringing. Addition of nitrogen to subirrigation water during prolonged periods of high temperature can be detrimental to the turf and should be avoided. Additional work at the University of Arizona has demonstrated that this problem is circumvented by surface application of nitrogen followed by a light sprinkler irrigation. Continued investigations on subirrigation of turf at the University of Arizona should provide additional useful information on this irrigation technique in the near future.

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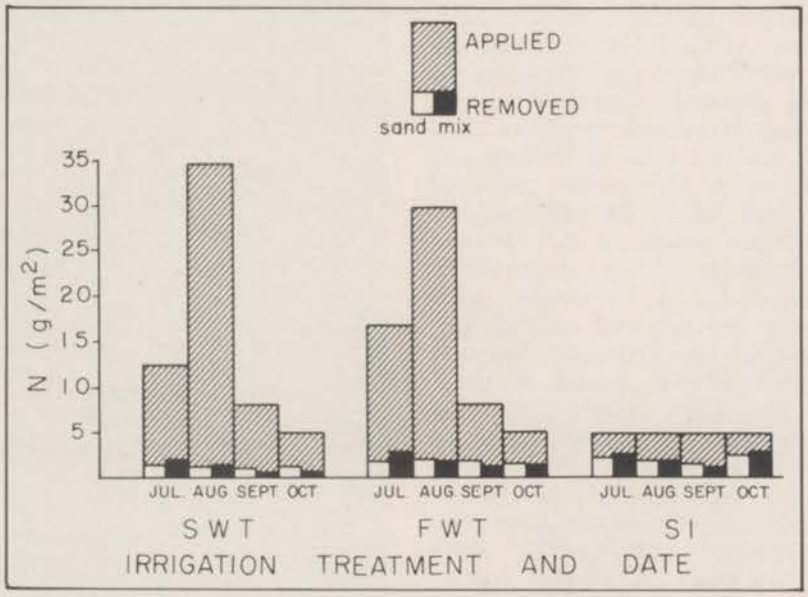
Figure 3 (below): Removal of applied nitrogen in bentgrass clippings as influenced by irrigation treatment and kind of soil during prolonged hot weather.



CORROSION *(from page 26)*

In the case of the medium piece, when water wore a big enough path through the threads, its jet action then caused erosion of the shank and the tubing joining the nipples. When the tubing was worn down to a thickness less than 1/64 of an inch, rupture of the tubing occurred due to insufficient wall thickness to resist pressure. Reference to the "Piping Handbook" indicates that joint sealants such as litharge and glycerine or glypton are preferred for tight joints. In addition, the Handbook points out that for two-inch pipe size, five threads should be engaged for a hand-tight connection. For two and one-half inch pipe size, approximately five and one-half threads should be used. The Handbook further states that Teflon thread lubricant should be used in assembling threaded PVC plastic piping. This obviously applies to joints that may have to be disassembled subsequently, since threaded joints of PVC pipe may be permanently joined using a thread cement such as PVC cement. This material uses a solvent such as tetrahydrofuran. This solvent is often pigmented blue.

It is therefore the obvious conclusion that someone assembling the copper fittings to the mating PVC threaded pipe used the blue PVC cement as the thread sealant. PVC cement is just that — an excellent cement and solvent for PVC but certainly not a thread sealant. Perhaps the convenience of the PVC cement being available in a can with a half-inch wide brush and applicator was too tempting to certain of the trades, and this cement was used rather than the conventional joint sealants, such as litharge or glycerine or preferably Teflon tape.

The purpose of this paper has been to make available an analysis of a mistake of others so that personnel in the business of installation of underground sprinkler systems would not fall into the same trap that was earlier committed. Proper materials require proper sealants and proper assembly, and no short-cuts. □

TABLE I

Form of Corrosion	Characteristic Appearance	Typical Conditions Causing Attack on Copper
Uniform	Thinning of entire area	Nitric acid, conc. HCl, oxidizing solutions, etc.
Galvanic	Localized attack where dissimilar metals are in contact (copper is usually cathodic or unattacked).	Graphite (or graphitic structure) in a highly conductive solution, such as salt water
Crevice	Attack within a restricted area	Metal-ion or oxygen concentration cells, mainly on metals that depend on oxide or passive films for resistance (not generally true of copper).
Pitting	Localized holes	Oxidizing solutions on partially protected surface (imperfect scale deposit).
Intergranular	Attack at metal grain boundaries	Excess copper oxide eutectic at at grain boundaries
Selective Leaching (Dezincification)	Removal of 1 element of alloy	Un-alloyed copper is immune.
Erosion	Mechanical wear	Water & brine at high velocities, esp. oxygen-saturated fluids
Cavitation	Considerably roughened	Water at high velocities or pulsating pressures
Stress	Cracking by combination of stress and corrodant	Ammonia complexes or mercury in water or air
Soil*	Thinning and/or pitting	Rifle peat soil (pH 2.6), cinders (pH 7.6) and Sharkey clay (pH 6.8)
Stray Current	Localized exterior attack	Electrolytic current from an external source, cathodic to copper.

*Data from "Underground Corrosion", M. Rtmanoff, NBS Circular 579; (1957) Pages 19, 20, 83, 84, 85

This is the two-inch ips male thread-to-tubing nipple soldered to a piece of two-inch tubing, in turn soldered to a two-inch to one and one-half inch reducing bushing, soldered to a piece of one and one-half inch tubing.