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Tom and Mike Caranci, father and son superintendent team.

In 1911, John Stroud, a Scottish greenkeeper visiting the California desert for the first time, observed that "while the land is cheap and plentiful in these parts, the climate will never support a fine 18-hole golf course the likes of which we have in Scotland."

With that, Stroud returned home convinced of the folly of the American land developers who had hired him to turn a 20,000-acre tract of wilderness there into a golfer's paradise.

Times change. And today, the California desert around Palm Springs supports some of the most beautiful, prestigious courses in the nation. Land is no longer cheap and plentiful. And the developers who seemed so crazy in 1911 now have grandchildren who laugh all the way to the bank.

Defying nature

But one part of Stroud's observation was true; the arid climate of the American Southwest does not lend itself well to the maintenance and upkeep of lush, healthy turf.

Today's golf course superintendents there face many of the same problems which Stroud had first envisioned: water is scarce, the dry season is long, and the land itself is less arable than a Scottish moor.

Tom Caranci, who has the development and maintenance of more than 35 courses throughout the region

Because of the large number of blooming shrubs and ornamentals Caranci has selected a soluble 12-31-14 formulation as his all-purpose fertilizer. It can be fed to both turf and blooming flowers.

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**Plant
Marvel**



—Dave Tooley
Superintendent
Lakewood Golf Course
Lakewood, Colorado



At Canyon Country Club, greens are fertilized once every seven to 10 days. To promote slow, steady growth, Caranci applies less than the recommended amount of soluble fertilizer, but applies it more often.

to his credit, and is regarded by many of his peers as the dean of Southwestern golf course superintendents, also cites three major factors, unforeseen by Stroud, that are beginning to alleviate some of the problems.

They are the widespread use of irrigation; the development of new turfgrasses able to survive in the arid climate; and, from his own experience, the use of soluble fertilizers in place of the dry granular form still favored throughout most of the nation.

Caranci puts the greatest emphasis soluble fertilizers.

"Water is scarce here," he says. "I soon found that the dry granulars I was using required too heavy of a watering cycle. To release the nutrients to the turf, and to keep our close-cut greens from burning, I was applying three times as much water as I would have in another climate.

"As a result, I often got puddles of standing water on the greens, when, at the same time, I had burned-out brown patches on the fairways not 15 feet away."

In an area where golfers pay for and expect finely manicured greens and fairways, it was becoming quite a problem. Years earlier, in 1968, Caranci had experimented with soluble fertilizers while serving as superintendent at a private 18-hole course in Hawaii.

There, the rich volcanic soil pro-

duced lush, fast-growing turf—too lush and fast-growing to allow for even putting on the course's greens.

Caranci heard about a soluble fertilizer that promised controlled turf growth, and gave it a try.

He was skeptical at first, "but soon, you could see that it was working. The roots were better developed and stronger; the foliage stood up to heavy traffic with less strain."

Compatible

Other benefits also became clear. The soluble fertilizer was compatible with the pesticides and herbicides Caranci applied. It could be mixed in the same tank, and applied at the same time, eliminating the need for the two-step application process he was accustomed to, and saving him a considerable amount of time and labor. Plus, he could apply the soluble fertilizer in different concentrations as the turf required.

Because it was absorbed quickly by both foliage and roots, it was less likely to be washed away or leached beyond the root zone during Hawaii's rainy season.

"I was very satisfied with its performance," Caranci remembers. "So when I experienced problems with dry granulars at Cathedral Canyon, I wondered if solubles might not work in an arid climate as well."

As Caranci's greens and fairways now attest, they do.

But Caranci is quick to point out that solubles are not the miracle cure for turf as some superintendents believe. He cautions each superintendent to have a soil analysis done, and take into consideration the type of grasses grown, the length of the playing season, and the region's climate

The arid climate of the American Southwest does not lend itself well to the maintenance and upkeep of lush, healthy turf.

itself before making a switch from dry granulars to soluble fertilizers.

"There are a lot of first-rate dry granulars out there," Caranci notes. "And they have their place. Even soluble fertilizer manufacturers will tell you that. But the more we superintendents learn about proper turf fertilization, and the sooner we realize that our time is worth a lot of money, I think we'll see a slow transition to the soluble fertilizers."

The transition at Cathedral Canyon was, however, anything but slow. After ascertaining that the manufacturer—Plant Marvel Laboratories of Chicago Heights, IL—did indeed make a soluble formula with the proper balance of nutrients and chelated trace elements for the summer bermudagrass and winter ryegrass grown on his course, Caranci immediately began regular application.

Soon, it was the only fertilizer he applied.

"I found that it required two-thirds less watering than dry granulars," says Caranci. "That's a big savings out here. And it helps save a lot of time and labor, because I just mix whatever concentration I want in our Injetomatic and pump it directly into the irrigation canals that feed the course. We've eliminated the standing water on greens, and the entire course is healthier, so it holds up better to the year-round heavy traffic."

Caranci applies the soluble fertilizer every seven to 10 days on his greens, and less frequently on his fairways. And because he believes that slow, steady growth is better in the long run, he generally applies less than the recommended amount.

"Maximum recommended application of most solubles is one pound per 1,000 square feet during the hottest, driest times of the year, and

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Solubles provide fertilizing option, increased control

In the past few years, sophisticated technology has been playing an increasingly important role in golf course maintenance.

Advanced fertigation techniques, chemicals and labor-saving equipment are giving the superintendent more control over his turf.

The move to soluble fertilizers parallels this growing emphasis on control. Solubles are not brand new on the market. Soluble fertilizers have been an option to superintendents for the past 10 years as an increasing number have experimented with them to supplement regular fertilization programs. This has especially been prevalent at times when traditional fertilizers have been less effective; namely, during the dry season, or when a quick green-up is required.

Compared to dry or liquid fertilizer formulations, soluble fertilizers tend to fall in a class of their own—a refinement of both dry and liquid, combining the advantages of both. For superintendents concerned with cost-effectiveness and control of nutrition, soluble fertilizers can be a viable alternative.

Soluble fertilizers come as a dry, very fine and easily diluted powder that ships and stores in bags and on pallets, just like dry fertilizers.

There is no need for large storage tanks, pumps or liquid transport equipment as with liquid fertilizer. All fertilizers use water to carry nutrients, since turf grasses can only absorb nutrients in liquid form. With granular formulations, nutrients are not readily available for absorption until water is added, either manually or as rainfall.

The amount of water necessary to release the nutrients depends on the type of fertilizer being used and the amount of moisture present in the soil. With so many

factors involved, a precise degree of control can be difficult to achieve.

Too much water, and nutrients are leached from the root zone. Too little water, and the turf starves or dry season burning is the result. Often an excess of time and water is expended.

Soluble and liquid fertilizers are both diluted with water prior to application to facilitate turf absorption. Nutrients are fed to the grass in a form that allows immediate uptake by the plant. In carrying these nutrients to turf roots, soluble fertilizers make efficient use of water and provide total control over the water/nutrient ratio so that the plant can receive the exact diet it needs.

This ratio also adapts easily to compensate for moisture in the soil make-up.

Liquid and soluble fertilizers are applied the same way. Frequently-used boom sprayers provide a method comparable in cost to applying dry fertilizer.

The labor and cost payoffs are even better when the course has some type of irrigation system. Simply inject the fertilizer into the water system, and fertilizer can be applied anywhere that water can be pumped. More and more superintendents are finding this method, often called fertigation, to have advantages. To aid in tracking the injected fertilizer flow, some manufacturers have incorporated tracer dyes into their soluble formulations.

Completely harmless to turf, the dyes allow the superintendent to tell at a glance which sprinklers are putting out fertilizer.

Generally, soluble formulations are more expensive than dry or liquid fertilizers because of the high nutrient content and the degree of refinement. Some superintendents contend the increased efficiency tightens the price gap. □

slightly more during other seasons.

Most soluble fertilizer manufacturers agree that although even the maximum recommended application will not burn turf, it is better to apply smaller amounts on a regular basis. This practice tends to produce healthier turf that grows evenly and at a controlled rate.

This year, Caranci predicts that he will apply varying amounts of five different formulations.

The use of more than one formulation during the course of a year is a practice which Caranci strongly endorses, believing that the nutrition delivered to turf should change with its seasonal needs, and as it enters new stages of root and foliage development.

For his all-purpose fertilizer, which, due to its high phosphorus level, he also feeds to blooming shrubs and ornamentals around the course, Caranci has selected a 12-31-14 formulation, the same one he first tried in Hawaii.

On his summer bermudagrass, he will supplement this with regular feedings of a 25-5-20 Bermuda Special

formulation; for his winter ryegrass, he applies 28-8-18, preceded by a heavy fall application of 13-0-44 high potash special, to prepare grass for winter stress and raise its level of disease resistance.

And, when soil analyses indicate that soil pH levels have risen too high, Caranci applies 25-5-20, a formula developed to supply bermudagrasses with the essential nutrients and trace elements they need, without the extra phosphorus they don't.

But, for superintendents who wish to emulate his success and rush out to buy the exact same formulations, Caranci offers a mild word of caution:

"I'm not here to tell other superintendents how to run their courses. I use only one manufacturer's products because I've found them to work best on my turf, and because they come in the specific formulations my turf needs, including trace elements. But no one NPK ratio will be right everywhere; even here, I sometimes mix formulations."

These words of caution are also echoed by Tom's son, Mike Caranci, who is golf course superintendent at

two 18-hole, 7,000-yard courses also in the Palm Springs area.

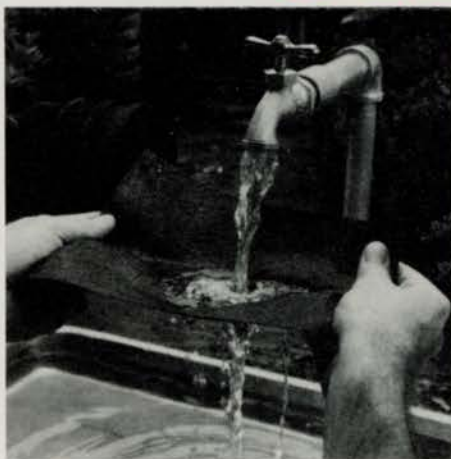
"Soluble fertilizers help to balance out growth so you can control it better," he says. "It makes my greens more even and keeps leaf blades thin. This makes the greens easier to mow with a finer cut. The end results are healthier, faster greens. Soluble fertilizers save time and money because they're easier to apply. But, yes, you have to be certain it's right for your course before you start using it.

"As far as I'm concerned, solubles, applied properly, make a lot of sense on today's golf courses." But, he says, each superintendent will have to make that evaluation for themselves.

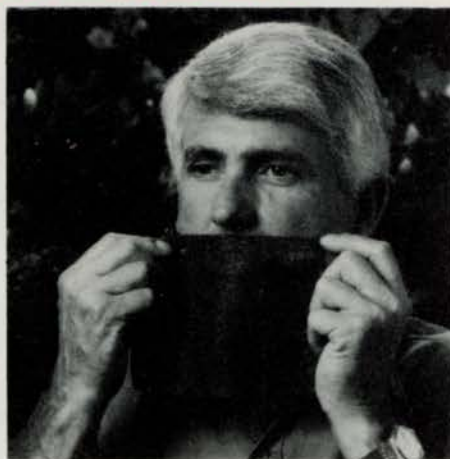
"This means as a group, we have to become better educated about fertilization. We have to begin to look at time spent on the course as an investment, and then decide which activities secure the best return on investment, and which ones don't. When we start to look at turf maintenance from a more scientific point of view, I think a lot of superintendents will realize the benefits offered by solubles."

WT&T

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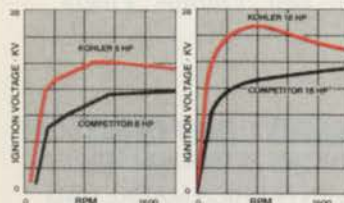
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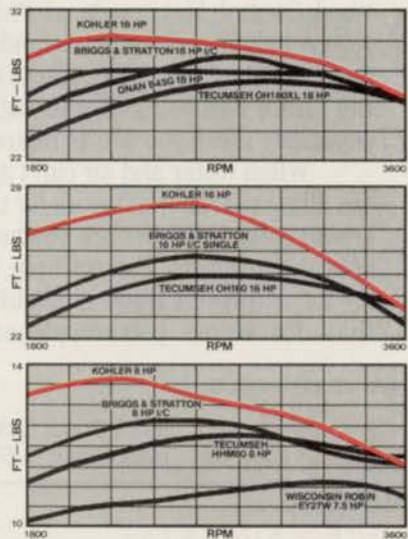
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Circle No. 145 on Reader Inquiry Card

PROBLEM SOLVERS

by Balakrishna Rao, Ph.D

Base watering on soil moisture

Problem: *Should a lawn sprinkler system be timed for 15 minutes each day or 1/2-hour every other day or night? (Massachusetts)*

Solution: Deep and infrequent watering is recommended for most home lawns to encourage deep rooting of turfgrass plants.

Deep rooting aids turfgrass establishment and drought tolerance. Ideally, watering should be based on soil moisture. As a "rule of thumb" watering once a week is sufficient; however, depending on the soil type and the time of the year, this frequency can change.

In answer to your specific question, it is better to water 1/2-hour every other day than to water 15 minutes every day. Shorter intervals tend to promote shallow rooting which may promote turfgrass susceptibility to drought. The best time to water would be about sunrise so that water on the leaf surfaces will dry before nighttime and discourage disease development.

Scale control for pin oaks

Problem: *How do I control the spread of scale on pin oaks? Dormant oil does not work. (Missouri)*

Solution: Usually dormant oil alone will not give 100 percent control of scale insects. The general principle in scale insect control requires the application of dormant oil when the plant is dormant plus one or more applications of insecticides for controlling crawler stages in summer.

Among many scale insects, obscure scale is one of the most common ones on oaks. Most likely this is the insect you are trying to control. For best results get the scale insect identified and then follow proper management practices.

Control of pine needle scale

Problem: *What can we use to control scales on pine needles? When is the best time? (New York)*

Solution: I believe you are referring to pine needle scale; however, it is important to properly identify the pest before applying pesticide to control it. Therefore, the following should help you identify the pine needle scale and its control. The pine needle scale attacks pine, spruce and occasionally hemlock, fir and taxus. Most severely affected are Austrian, Scotch, white, red and mugho pines and white and blue spruces.

This sedentary insect sucks large amounts of plant juices, turning the needles yellow and causing them to drop prematurely. If left uncontrolled, infestations can stunt and gradually kill branches and entire trees. Pine needles may appear nearly white

when heavily infested with pine needle scale, an elongated insect one-tenth inch long, white with a yellow spot at one end.

During the fall, purple-red eggs are deposited beneath the white female covering; these eggs overwinter and hatch in late May (when lilac is in full bloom) and the reddish crawlers emerge from under the mother covering. Crawlers migrate to the new growth and, once established, do not move again.

In about seven weeks, this first brood matures and produces a second generation in late July. This brood matures in October and lays eggs which overwinter. Apply 60 or 70-sec. oil or oil plus ethion in April to kill eggs. This alone may not adequately control the problem. Therefore, apply malathion or dimethoate in late May to control crawler stage.

No leaching problem with Oftanol

Problem: *Is Oftanol subject to leaching when used on sandy soils? (Ohio)*

Solution: The manufacturer's (Mobay Chemical Company) representative indicated that, based on their research findings, Oftanol is not subject to leaching when used on sandy soils. Most of the Oftanol applied will remain in the thatch and soil interface. At 20°C the solubility of Oftanol in water is 20 ppm, which means it will dissolve in water but will not move rapidly.

In research on heavier soils (silty loam), the active ingredient and the next analogue was not found below two inches in a treated area. Although there is not enough information on Oftanol leaching in sandy soils based on the above research findings, Mobay does not expect the Oftanol to leach in soil.

Ground cover weed control

Problem: *Name some chemicals to safely kill crabgrass and weeds within ground covers such as junipers, ivy, etc. (Maryland)*

Solution: A number of preemergent herbicides such as Betasan, Dacthal, Enide, or ornamental weeder can be used safely to control crabgrass and other weeds in ground covers such as juniper, ivy, etc.

Since different herbicides may not be safe to use around the same ornamentals, read and follow directions on the label.



Balakrishna Rao is Director of Lawn Care Technical Resources for Davey Tree Expert Co., Kent, OH.

Questions should be mailed to Problem Solver, Weeds Trees & Turf, 7500 Old Oak Boulevard, Cleveland, Ohio 44130. Please allow 2-3 months for an answer to appear in the magazine.