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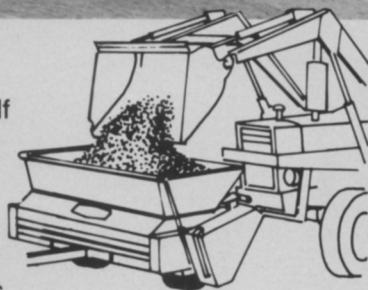


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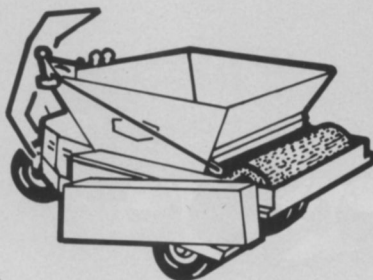
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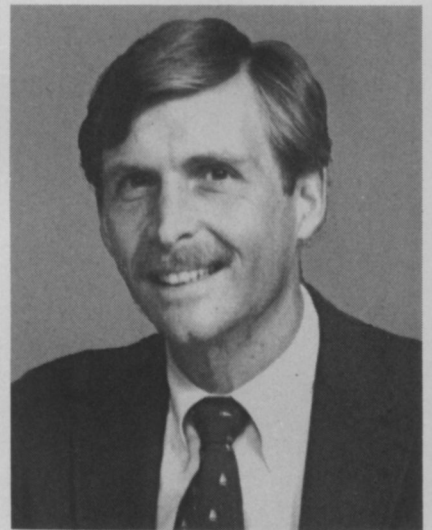
to figure out what kind of rate we need to charge to recover overhead and make a profit.

"Charges run 7, 10 and 12 percent based on the size of the account. The bigger the account, the less overhead."

Tracking material cost

Materials are kept track of separately. Every year Wathey develops an operating budget using historical records to determine square footage costs for materials. They don't keep track by account. It's all done at the fiscal budget level.

The materials management system is controlled by matching actual use against a budget prepared by supervisors when the contract is awarded. The exciting part is that the computer does all the calculations for them. "All I have to do is review it and see if it makes sense," Wathey says. "If a bid



"From the beginning, we wanted to compare bid estimates with actual costs."

is way off, we go back to the customer with the numbers on a computer print-out."

Over the next year, Northwest will be converting the Dec Vax and Rainbow PCs in Portland to an IBM 386 compatible network. "When we needed a computer in Seattle, we went with an IBM compatible rather than continue to invest money in obsolete equipment. By using the computer system, composite rates and turf routes, and doing good follow-up evaluation, we've had excellent experience matching our actual costs to our budget figures. Now we want the whole system integrated so we can take advantage of MSDOS landscape programs as well as our Lotus and WordPerfect programs," Wathey concludes.

LM

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Portland's Tom McCall Waterfront Park is the highest use park in the city. Operational personnel there have instituted a system that successfully bridges the gap between those who enjoy the park and those who maintain it.

TRAFFIC DOESN'T DAMPEN BEAUTY OF PORTLAND PARK

To keep Tom McCall Waterfront Park looking good, Portland's Parks Bureau broke it into more manageable areas, established experimental turf areas and upgraded its maintenance practices.

Portland, Oregon's Tom McCall Waterfront Park is often referred to as the flagship of the city's parks system. The 26-acre park, located on the banks of the Willamette River in downtown Portland, is the city's highest use park, with major events scheduled throughout the summer drawing thousands of people.

The park is accessible to residents and visitors in the downtown area. Views of highrises to the west, the river and distant mountains to the east provide an exciting setting that blends urban

and pastoral scenery.

Festival time

The park is host to numerous annual festivals, including Cinco de Mayo in May, Neighborfaire and The Bite in July and weekly symphonies in August. In fact, there are 10 major events that draw between 50- and 100,000 participants from May through September, and many smaller events.

But the Portland Parks Bureau's Maintenance and Operations crews are constantly struggling to keep up with usage demands. For them, the

popularity of Waterfront Park has become too much of a good thing.

Over the last few years, the Parks Bureau has developed a variety of methods for dealing with this heavy use. These include establishing new user's fees, breaking the park up into more manageable areas, constantly updating maintenance procedures, and establishing experimental turf areas.

Crowds a problem

The event that draws the largest crowds and wreaks the greatest amount of devastation on the turf is

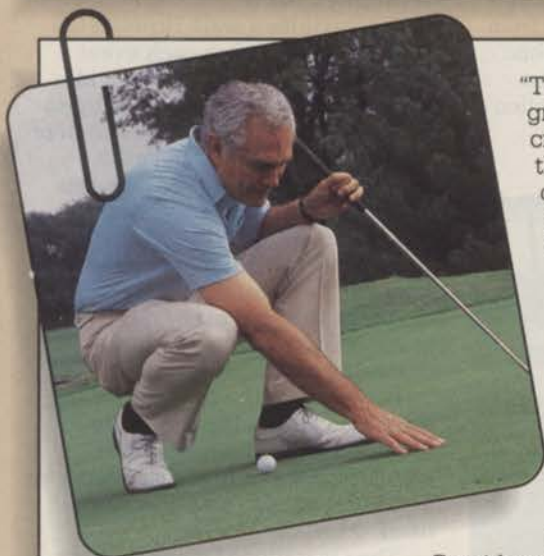
BENTGRASS



"We planted the 12th hole on Singing Hills' Willow Glen Course to SR 1020 two years ago, and it performed admirably. What's really significant is that members keep asking what we've done to the 12th hole that makes it putt so well! The members like SR 1020's performance from the players' point of view; we like that too, but we also value that we

haven't had to change our normal greens maintenance program to achieve the results."

David Fleming, C.G.C.S.
Superintendent, Singing Hills Country Club
El Cajon, CA



"The newer golf course greens planted to Penn-cross look beautiful, but they don't putt like the old South German Bent greens. The putting surface of those old greens is fine-textured, not thatchy or grainy, and the old greens don't show the spike marks like Penn-cross. We've been needing bent-grasses bred for golf quality as well as turf quality for a long time, and it

looks like SR 1020 and Providence fill the bill!"

Peter Trenham
President, Philadelphia Section PGA
St. David's Golf Club
Wayne, PA

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And, for real golfers like Peter Trenham, SR 1020 has proven it provides everything desired in a putting green bent: fine texture, uniform surface, and most importantly, an absence of grain, so the ball holds the line for true putting accuracy.

With Providence (SR 1019) and SR 1020, you can look forward to a good-looking grass that will give you the performance you demand and the putting green quality your golfers prefer!

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unquestionably the Rose Festival Fun Center, which runs for two weeks during the end of the area's rainy season. The festival uses more than half the park acreage and requires several days for set up and tear down. During these three weeks all irrigation is shut down.

Over one million feet and innumerable wheels from baby strollers can turn the turf into an oozing quagmire. If, on the other hand, there is no rain, the lack of irrigation results in compacted, dry, burned out areas.

When the last of the carnival is hauled away, the Parks Bureau has less than two weeks to repair the turf before the next major event, Neighborfaire. In the meantime, hundreds of people continue to use the park each day and smaller special weekend events draw thousands.

The first major part of the renovation process involves dragging a six-foot magnet over the turf to find bolts, nails, bottle caps, wire and other metal that might damage turf equipment or park users. This two-to-three day project "takes time but is a key function in our operation," according to Jim Carr, mowing and turf manager for the city.

Remove contaminants

After dragging the magnet, the parks crew removes any soil contaminated by oil, grease or hydraulic fluid which would kill the grass. They then aerate, topdress and overseed as needed.

Until very recently, park users paid a single permit fee (\$5) for which they could use any or all of the 26 acres and were supposedly responsible for cleaning up their mess. In reality



An experimental section of the park has a 20-inch deep sand medium under perennial ryegrass. A nearby sand sod field provides patches for repairs.

however, taxpayers picked up the bill for most renovation.

In January, 1989, all of that changed. The park was divided into seven sections and a new fee structure was instituted. Now, depending on the area used, the number expected and the activity planned, fees range from \$25 per day per section for a public event where no sales or profit are involved to \$500 per day per section where products will be sold or admission charged.

Under these new regulations, the Parks Bureau can now bill event organizers for any destruction of park property, such as costs for turf renovation and irrigation repairs.

Who pays for it

Carr schedules a walk through the area before and after each event with the event user. This provides the user and the Park Bureau up-to-date information on the condition of the Park, Carr says. The Parks Bureau then assesses the damages after the event and schedules the repair and renovation.

Because festival organizers know they will be accountable for damages, it is in their best interests to insure that vendors reduce damaging practices.

Breaking up the park into seven areas also allows the Bureau to schedule individual areas for maintenance and to assign events for areas best suited to a particular need.

The Operations Division works closely with the park permits desk to schedule open times for maintenance and repair activities in certain sections of the park when needed.

The park also contains a 4½-acre experimental section that has been developed for ease of maintenance year-round. "We needed a turf area



Following a major festival in mid-June, the maintenance crew drags a magnet over the turf to remove bolts, nails, bottle caps, wire and other metal.

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with good drainage for use during heavy spring rains and some compaction resistance for heavy traffic," Carr says. "We restored this section using specifications for a sports turf area, often referred to as the optimum high-use athletic field."

Sand base

The sports turf has a 20-inch deep sand medium, using granular pitrun sand (with most sand particles falling between No. 16 and No. 60 screen) with no organic material and no fines which would tend to lock up. Straight perennial ryegrass seed was sown onto the sand base. This results in much higher fertilization needs and supplementation with lime and micronutrients.



Too much of a good thing? The aftermath of Neighborfaire.

About twice a year the maintenance crews take soil samples to determine pH levels and nutrient deficiencies.

"We look for a well-balanced fertilizer, something that is geared for the acidic soil conditions west of the Cascades, usually a 6-1-3 or 6-1-4 ratio," Carr says. "We use a slow-release sulphur-coated fertilizer so we are able to put down sufficient nitrogen as well as phosphorus and potassium or N-P-K."

"Because of the high use, we feel it is important to have as many micronutrients as possible—iron, manganese, molybdenum, copper, zinc, boron—anything we can do to help revitalize the area."

Construction of this high-use turf began in 1986 and was completed in the summer of 1987. "It has become a very desirable area because it shows minimal wear and is kept fairly lush," Carr says. It is

scheduled for moderate use, such as the once-a-week Waterfront Classics that draw about 30,000 people.

The area can be irrigated the day before it is used because the drainage prevents standing water, Carr says.

Simple restoration

"And it is relatively easy to restore. By doing complete aeration and a light topdressing with overseeding a couple times a year, we're able to restore that area and get a good recovery within a week or 10 days after seeding."

To help maintain the sand-based turf, the bureau has established a straight sand sod field from which they can extract sod patches. This

*The reality is...
that the over-
scheduling of the
park is impossible
to deal with.*

allows the crews to fill in divots, voids and holes using the same sand medium. By not adding soil or other foreign organic matter, the purity of the turf is retained.

Adding regular sod with a sandy loam soil would cause the sand to lock up, forming an almost cement-like base, Carr says. "We've been able to move the sod without using netting or organic materials. We use a heavy seeding, roll it and then use it within a few hours. We've had excellent recovery—the grass patches take right off."

Carr has had good luck establishing the sod field. Within three months of seeding, the sod field can be cut and used as patches. "Grass on straight sand is working beautifully for us," he notes.

Due recognition

In November the Bureau and Waterfront Park received an award from the Oregon Parks and Recreation Society for excellence in maintenance, particularly under difficult circumstances. Considering the adverse conditions under which they work, Bureau personnel believe this recognition from their peers is indeed an honor.

"It's a very special award to us for a very special park," says Ron Maynard, acting director of Parks and recreation. "On a weekly basis we run the risk of loving it to death." **LM**

Maintenance of sand based turf

Many of the turf areas in Waterfront Park were developed 12 years ago with a sand base and sod containing several inches of loam topsoil. Over the years the combination has resulted in hard compaction on the surface with little drainage.

To break up this compaction, the bureau uses both core aeration and core removal aeration, depending on park scheduling. Shatter core allows aeration with minimum time between events.

After aeration, the turf is topdressed with a clean sand medium using a golf course greens-type topdresser to encourage drainage. The field is then dragged to break up aeration plugs. The topdressed area is then overseeded with straight perennial ryegrass.

"We're constantly changing our specifications, looking for the most drought-resistant, most wear-tolerant ryegrass available. Having the seed capital of the world here in Oregon, we're able to capitalize on the Washington and Oregon state field trials and have better accessibility to new seed varieties, says Jim Carr, mowing and turf manager for the city of Portland.

To control *Poa annua*, the Parks Bureau uses a selective spray such as Nor-Am's Progress. This product also controls cheat grass, foxtail and other noxious weeds but doesn't affect perennial rye. Carr says the bureau has success with Progress within two weeks after the seed drop and re-seeding with perennial rye.

"Fertilizing is perhaps one of the most important things we are able to do down there. We probably fertilize more often there than in any of our other parks, for both aesthetic purposes and to keep the turf well fed."

Carr notes, however, that they avoid fertilizing right after overseeding. Fertilizing too soon discourages full germination of the seed by encouraging rapid growth of existing grass which competes for nutrients and water and shades the new seeds.

"We like to wait until we get one- to two-leaf germination in the new seed before fertilizing," he says. □

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Special alloys make our units strong, easy to handle and extremely light weight. But our T-27 still delivers greater horsepower than either Echo or Green Machine.

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FIGURING THE COST OF FERTILIZER

Simple mathematics can tell you when it's a waste of money to apply additional fertilizer.

by S.T. Cockerham, University of California, Riverside

In most crops, fertilizer inputs are measured against yield; for important purchases, the cost is evaluated against return. This doesn't work in turfgrass management, for the simple reason that there is no measurable yield.

Sod producers sometimes try to compare growth rate and turf quality to fertilizer cost to determine when applying more fertilizer becomes a waste of money. But few growers are satisfied with the procedure.

Turfgrasses readily respond to nitrogen (N) fertilizers because N is frequently deficient. Usually a dramatic color response is followed by rapid growth. Once the turf color is as green as it can get, increasing the N rate continues to increase the turf's growth rate. At some point, however, the turf growth rate no longer increases as fast as the increase in nitrogen. That is when it is no longer cost-efficient to increase the N application rate.

Weighing clippings

One way to measure turf growth rate is to weigh the clippings removed at mowing. In Fig. 1, the clipping yield increases with increased nitrogen up to 4 lbs. per 1,000 sq. ft. when the rate actually causes a reduction in the clipping yield, therefore, a reduction in growth. Before that point the growth rate increase slows down with increased nitrogen.

For example, the growth rate increase in going from 0.5 to 1.0 lb. N is several times that measured going from 1.0 to 2.0 lbs. N. This means that fertilizer costs increase significantly for the small gain in growth rate.

In Fig. 2, the root and rhizome dry matter yield of Kentucky bluegrass drops off very significantly from 0 N to 0.75 lbs. 1,000 sq. ft./month. Over 0.75 lbs. the rate of root and rhizome growth nearly stops. Eventually, the roots reduce in number and length.

There are agronomic as well as economic upper limits to nitrogen fertilizer applications.

FIGURE 1. CLIPPING YIELD RESPONSE TO NITROGEN

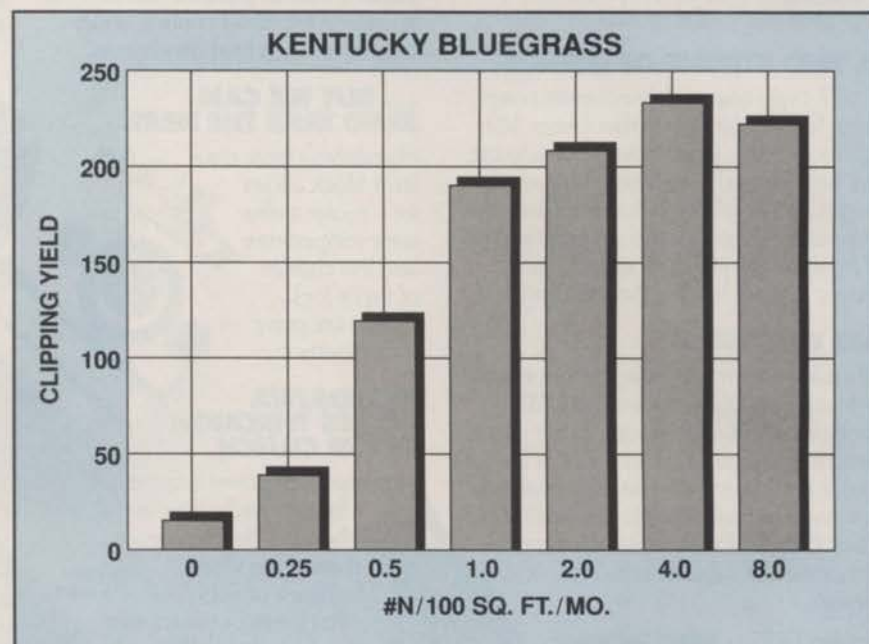


FIGURE 2. ROOT AND RHIZOME RESPONSE

