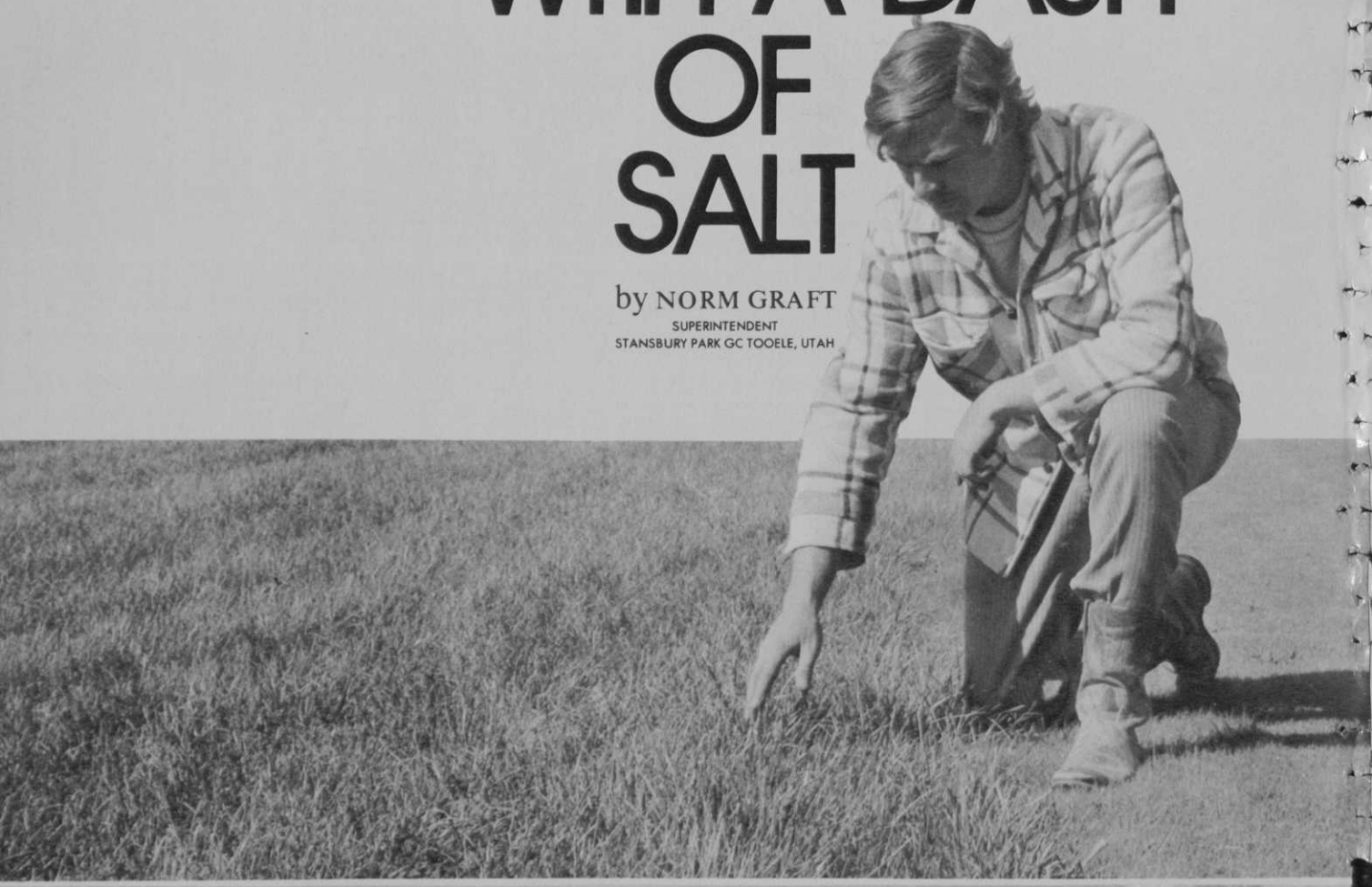
GOLF WITH A DASH OF SALT

by NORM GRAFT
SUPERINTENDENT
STANSBURY PARK GC TOOELE, UTAH



The Great Salt Lake Desert, a vast wasteland with only occasional intrusion by super-car buffs, now is the unlikely location for the Stansbury Park GC. The course's superintendent, an obvious voice of experience, offers some solutions when dealing with saline soil conditions

Golf course turf can be grown almost anywhere—if you avoid any fights with nature. This maxim is illustrated at Stansbury Park GC, on the western slope of the Oquirrh Mountains, 25 miles west of Salt Lake City. It is part of a new city being developed by Terracor, a Salt Lake City-based corporation. The golf course itself is located about a mile and a half from the south shore of the Great Salt Lake.

Because the course is located relatively close to the Great Salt Lake, much of the land had been reclaimed as the lake receded. Some of the land was still in its original condition. Farmers didn't have adequate water for reclaiming and pasturing the land.

As the golf course was constructed, roughly 800,000 cubic yards of soil were removed. The top soil was stripped off and stock piled, to be put back as part of the finish grade. It was during this manipulation of earth, that soil problems developed.

Soil from depths to five feet were redistributed in the soil profile. In some areas, salty subsoil was placed near the surface. The result was

Norm Graft, top left, examines bentgrass turf and alta fescue roughs. Top right, lower left and middle photos show salt and sodium damage. A woman crew member sets up the irrigation sprinkler system.

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that salt and sodium soon contaminated the growing surface of the golf course. Salt basically causes a water uptake problem for plants and is in itself phytotoxic to plants. Sodium is also phytotoxic, but, more importantly, it may break down the soil structure should it become the dominate soil cation. Should the soil become puddled, oxygen diffusion and water infiltration rates are reduced to a point that makes it nearly impossible to maintain a playable turf.

Salt may be removed from the soil fairly easily if water can pass through the profile. The silt-clay soil at Stansbury Park made rapid leaching impossible. Sodium can also be removed from the soil as long as two things are happening.

1) Water must be able to percolate through the soil.

2) Calcium containing soil amendments, such as gypsum and calcium chloride, must be incorporated into the soil to exchange the sodium with calcium. Therefore, the displaced sodium moves downward and out with the percolating water.

The results of soil tests and visual observations suggested that water movement through the soil would be difficult unless a substantial drainage system was installed. The cost of a system with the proportions needed would have been astronomical. Therefore, a search was begun to find a turfgrass that would tolerate the current conditions and improve over time as soil conditions improved.

The developers decided to adapt a plant to the soil, rather than adapt the soil to the plant.

Research done by Dr. Howard Peterson, Utah State University soil-water engineer, Terracor agronomist Dave Bingaman, assistant superintendent Bill Porter, an agronomy major from the University of Maine, and myself, indicated that the saline and alkaline condition of the soil made the use of conventional cool-season grasses unacceptable. Therefore, a suitable substitute had to be found. Finding tolerant grasses was relatively easy. But, finding a grass that could be accepted as a golfing turfgrass with suitable playability was much more involved.

A check with other golf courses in the area with similar types of soil problems proved informative—not because these courses were grassed according to soils, but because it became quite apparent that certain grasses were doing much better than others. Bluegrass was adversely affected in saline and alkaline soils, tall fescues did better, and seaside bentgrass did the best of all. The solution was then a matter of determining just how much salt and sodium seaside and tall fescue could withstand.

Contact was made with many of the leading turfgrass researchers and superintendents, and scanty information was gathered.

Dr. James Beard, Michigan State University, knew of a paper by Oertleand Youngner that appeared in "Agronomy Journal." It was a salt tolerance comparison of seaside bentgrass, alta fescue, *Puccinellia distans* (a salt grass) and

Kentucky bluegrass. The study showed that bluegrass was extremely salt sensitive and that alta fescue and seaside bentgrass were the most tolerant. *Puccinellia distans* was eliminated because of the unavailability of seed.

When the study was compared to our soil tests, it was obvious that bluegrass had to be eliminated and that alta fescue and seaside were most adaptable to our soil. Bermudagrass wasn't considered because of our climatic conditions and because it is classified as a noxious weed by the state of Utah. Zoysiagrass is under consideration for other high use turf areas.

Tees and greens presented no problems because imported sandy soils were used.

The golf course was seeded during early summer of 1971. The fairways were seeded to seaside bentgrass at 40 pounds per acre, and roughs were seeded with 120 to 150 pounds per acre of alta fescue. In August of 1971, we opened the course for limited play.

Germination percentage was tremendous due to good distribution of seed, warm soil temperatures and most of all to very diligent irrigation by an all-woman grounds and irrigation crew. The only areas that didn't respond well were areas where the irrigation pattern wasn't adequate. Stansbury Park also had a few places where soil conditions apparently had an adverse effect, even on seaside. These were places adjacent to golf course lakes where water movement from the lakes laterally and upward, due to evaporation, raised salt levels above the tolerance levels of alta and seaside.

An important item used in reclaiming salt-affected land is the percolating of good water through the soil. Fortunately, Stansbury Park has large amounts of culinary-quality water available for irrigation purposes. As a result, the problem of reclaiming the land was minimized. We percolated about 60 inches of water through the soil in five months of irrigation. This was equivalent to five years of annual rainfall at Stansbury Park.

The following are Terracor's recommendations for those interested in establishing turf on soils of very high salt content:

1) Have complete soil tests taken before construction begins so that you know exactly what you are working with;
2) Accept the suggestions of soil scientists, they know their business well;
3) Look at other similar sites, learn from their experiences and be willing to change;
4) Design an irrigation system with soil and water intake rates in mind;
5) Landscape with adaptable plants;
6) Use irrigation water of proper quality;
7) Continue monitoring soil through soil tests.

Basically, what has happened at Stansbury Park is that a little "science in action" was applied and a difficult problem appears to be resolved. Nature was kissed instead of man-handled and the Stansbury Park GC is well on its way to becoming one of the finest in the Intermountain West. □