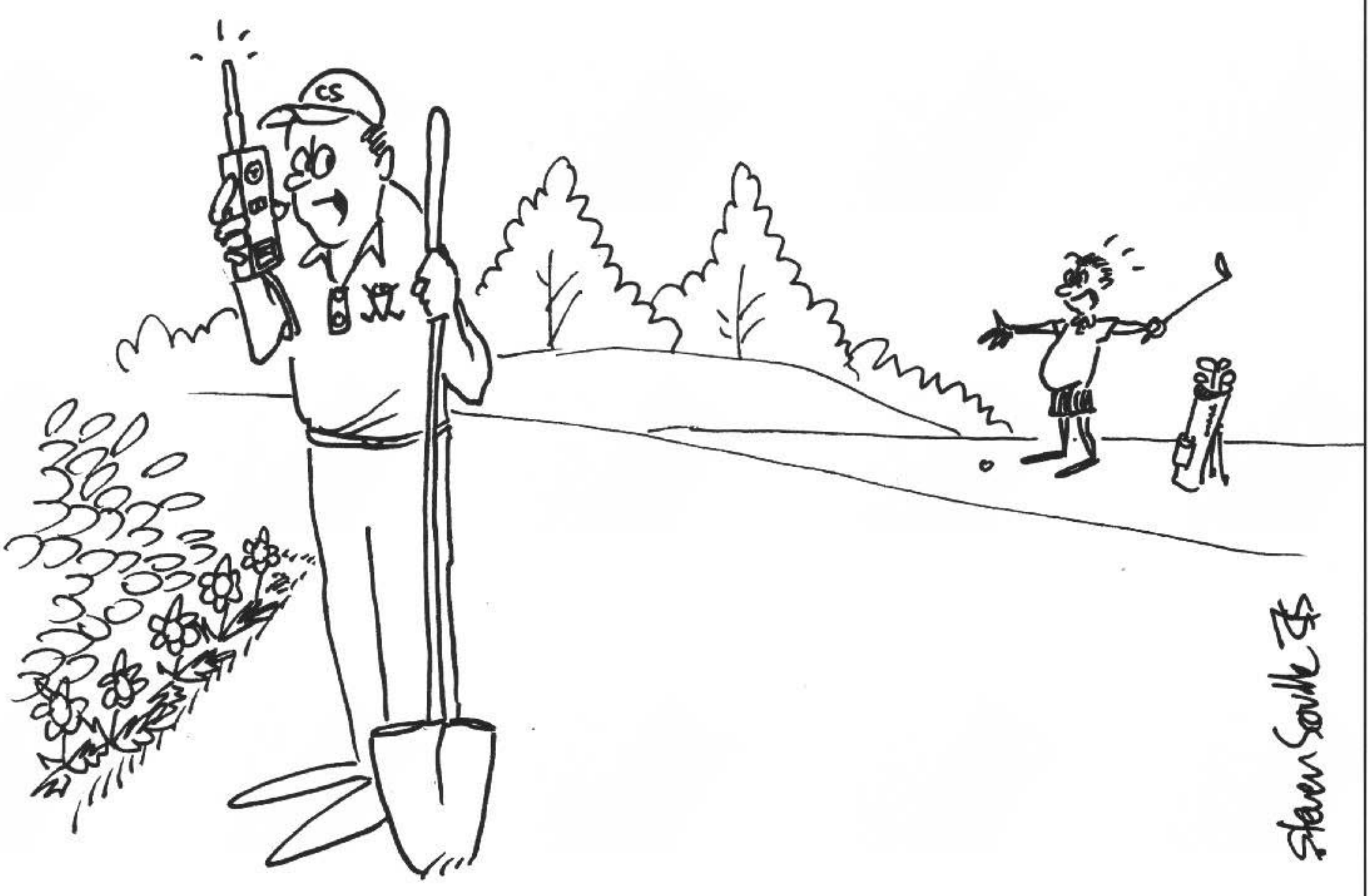
Faulks Bros. Construction Makes Major Contribution to the Noer Facility

"If you're going to be in for a dime, you may as well be in for a dollar," was the way Chris Faulks explained her company's very generous gift to the industry while we were both attending the WGCSA meeting in April at Ives Grove.

I had told her how overwhelming their gift to us was—over $29,000 according to the University of Wisconsin Foundation—and how much it was appreciated. Waupaca Sand and Greensmix essentially made the new and enlarged pathology research plots designed by Jeff Gregos a possibility.

She was very matter-of-fact when she explained how they decided to offer assistance of such magnitude. "The investigations that will take place on the new research area will be important to Wisconsin golf course superintendents. That alone made it an important project for us," Christine said.

They join pretty elite company—only a handful among us have been able to do what Faulks did. Big time thanks to them.



"HEY! REMEMBER THAT GUY WHO ALWAYS COMPLAINS ABOUT THE LACK OF WATER FOUNTAINS ON THE COURSE? WELL, HE'S ON THE 4th FAIRWAY.... TURN ON THE SPRINKLERS!"

JOHN MUIR — *A Wisconsin Great*

By Monroe S. Miller

When the world thinks of great naturalists and conservationists and environmentalists from our beloved Wisconsin, it usually thinks of Aldo Leopold. His name was usually the first to come to my mind, too.

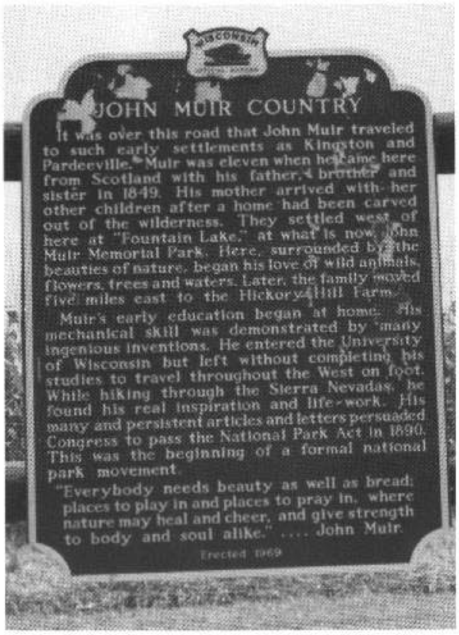
Professor Leopold is more contemporary and his book, *A Sand County Almanac,* has gone through many many printings and is on the bookshelf of nearly everyone who loves the outdoors.

It took a trip to the GCSAA conference in San Francisco three years ago to get me thinking about John Muir again. Like many others, Cheryl and I visited Muir Woods and haven't really been the same since. The giant redwoods that have been preserved mainly through the efforts of Muir overwhelmed us. The emotions we felt among those largest living things on earth were like those that result from standing in a great cathedral—what you feel is humility and insignificance. Muir Woods could even be called "nature's cathedral".

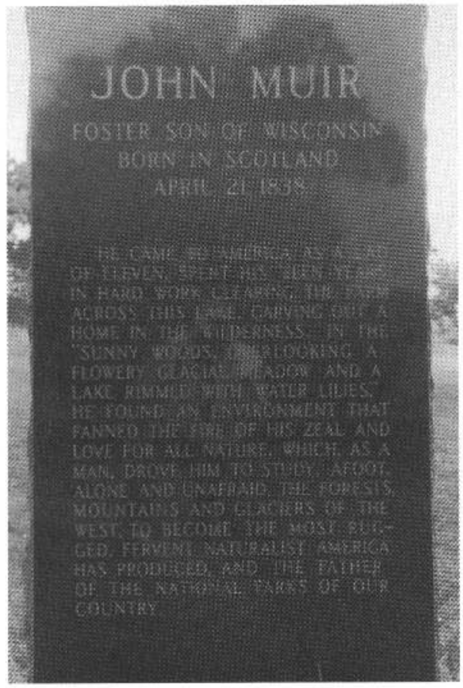
When we got home I went to the University Bookstore and bought a copy of Muir's book *The Story of My Boyhood,* knowing that he had grown up in Wisconsin and attended the University of Wisconsin in Madison. Although I was not completely ignorant of John Muir, I had no idea of the enormity of his life's accomplishment. Time, I fear, has dimmed knowledge of his work.

His boyhood book, which I've now read two other times, led to other extensive reading and to a number of trips to the place in Wisconsin where he grew up. I am lucky—his boyhood home isn't much farther from my home than Aldo Leopold's shack in the sand country. Let me tell you a little bit about his life, especially while he was here in our state.

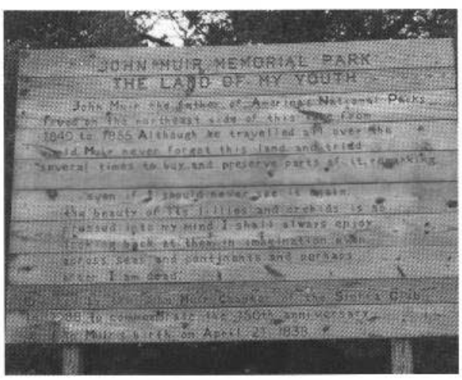
I find myself often looking for connections, with people and places and events. They were plenty evident with Muir—Scotsman, farm kid, Wisconsin grown, UW-Madison education.



Wisconsin road marker south of Montello on Wisconsin Highway 22, east of Muir Memorial Park.



Official memorial sign at Muir Park.



Welcome sign at Muir Memorial Park.

Those all served as an inspiration to learn more. Unlikely as it would seem, I found a connection with Muir and golf. Two other Scottish immigrant families in the same farm and rural neighborhood the Muirs lived in had sons the same age as John. The Grays, from Edinburgh, lived south of the Muir farm, and the Taylors farmed next to the Muirs. David Taylor and David Gray were strong friends with John Muir. David Taylor,

Ennis Lake today. The original Muir homestead would have been on the left of the photo, across the lake. Nothing of that homestead remains today.

Ennis Lake, formerly Muir Lake and formerly Fountain Lake.

as a competitive youth in Scotland, had played "goff" (golf)!

Muir came to Wisconsin from Dunbar, Scotland, a coastal town east of Edinburgh and down the coast (south) from St. Andrews. His father Daniel was a tough and disciplined parent—John had learned almost the entire bible by heart by the age of eleven, the age when the family left for America. The discipline was something John carried with him his entire life, something that he was in fact grateful for having. So tough was his father that he kept the diets of the children light, feeling that a spartan existence nurtured the soul.

Daniel Muir owned a grain shop in Dunbar. He sold it in 1849 and emigrated to Wisconsin. Although he wasn't a farmer in Scotland, he left there because of a desire to own land. He chose Wisconsin because an American told him most of the wheat he bought came from our state. It may have been good luck that he was ignorant in farming matters—he well might have ended up elsewhere.

But fate brought the Muirs to an area south and a little west of Montello (north and a bit east of Portage) in Marquette county. The soil was thin, but he chose it over rich bottomland soil because of the value he placed on wood and water. They built their homestead on 160 acres on the edge of a pond Muir named Fountain Lake. Generations later knew it as Muir Lake; today, maps and gazateers show it as Ennis Lake.

John Muir was ecstatic with the new home in Wisconsin. Their farm was rich with wildlife, birds, insects and, maybe especially, plant life. If you drive to the farm site today, you will see a lot of what John Muir saw 150 years ago. The lake area is wild and varied and has been preserved as a 160 acre county park, named for John Muir. Emeritus Professor Hugh Iltis of the UW-Madison (for years he was director of the UW Herbarium), a world renown botanist, once collected more that 250 plant species on a brief visit to the lake. The soil types vary so much that a piece of ground only 12 inches higher than an adjacent piece yields an entirely different flora.

Music farmed at the Fountain Lake site for eight years. Daniel Muir, as I have noted, had no knowledge of agriculture, used no fertilizer or manure on his fields, and wore the land to the point of poor crop yields. So he started a new homestead about four miles east and south of Fountain Lake, and named it Hickory Hill. He built a large stone house and a very substantial barn. Both are still in use today. He put the buildings in the middle of his 320 acres so his sons wouldn't waste time walking to the fields to work!

Hard work, long days and no free time were the story of John Muir's youth. Despite the gruelling 16 hour days, he could survive on little sleep and spent nights reading and learning on his own. The only formal education of his childhood came in Dunbar, Scotland. Yet he borrowed books by Dickens, Shakespeare, Milton and other classic authors. He read the journals of explorers like Mungo Park and Alexander von Humboldt. All inspired him throughout his life.

And Muir early on showed a genius for machinery. Many days, after five hours of sleep in the Hickory Hill farmhouse, he would go the the cellar to work on his inventions. He built things from scraps of metal and from scraps of wood, things like pyrometers, hygrometers, waterwheels and clocks. He built a sawmill, and scrap from an old wagon ended up a thermometer that was so sensitive it detected a man's body heat from four feet away.

He was also an accomplished whittler, which led to a number of inventions, and in 1860 a neighbor suggested John take some of his inventions to the Wisconsin Agricultural Fair in Madison. After a lot of soul searching, he decided to travel to Madison. He was 22 years old and left home with $15 in his pocket and his hickory wood inventions in a wagon. His brother took him to Pardeeville to catch the train to Madison.

Muir was the hit of the fair, making headlines in the *Wisconsin State Journal*—"An Ingenious Whittler". Interestingly, the State Fair was held where we all now watch the Badgers play football—Camp Randall on the UW-Madison campus.

Two things happened to Muir while in Madison: he found a job in

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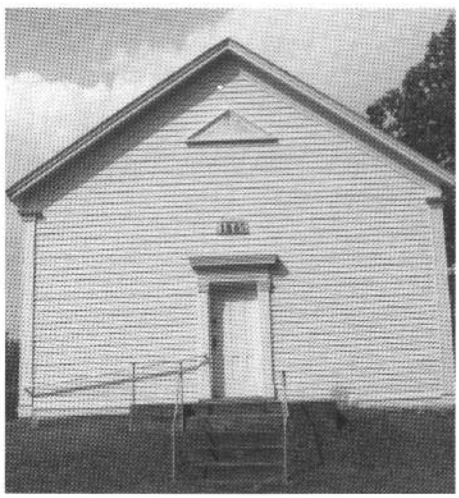
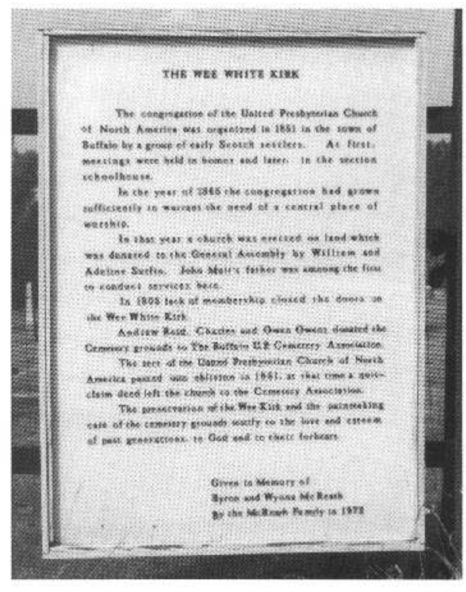


The small Presbyterian church where Daniel Muir, John's father, was a frequent preacher.



Historical sign next to cemetery and "wee kirk".

The Kearns family has had the Muir family farm—Hickory Hill—for over 100 years.

Observatory Hill, one of Muir's favorite places near his home.

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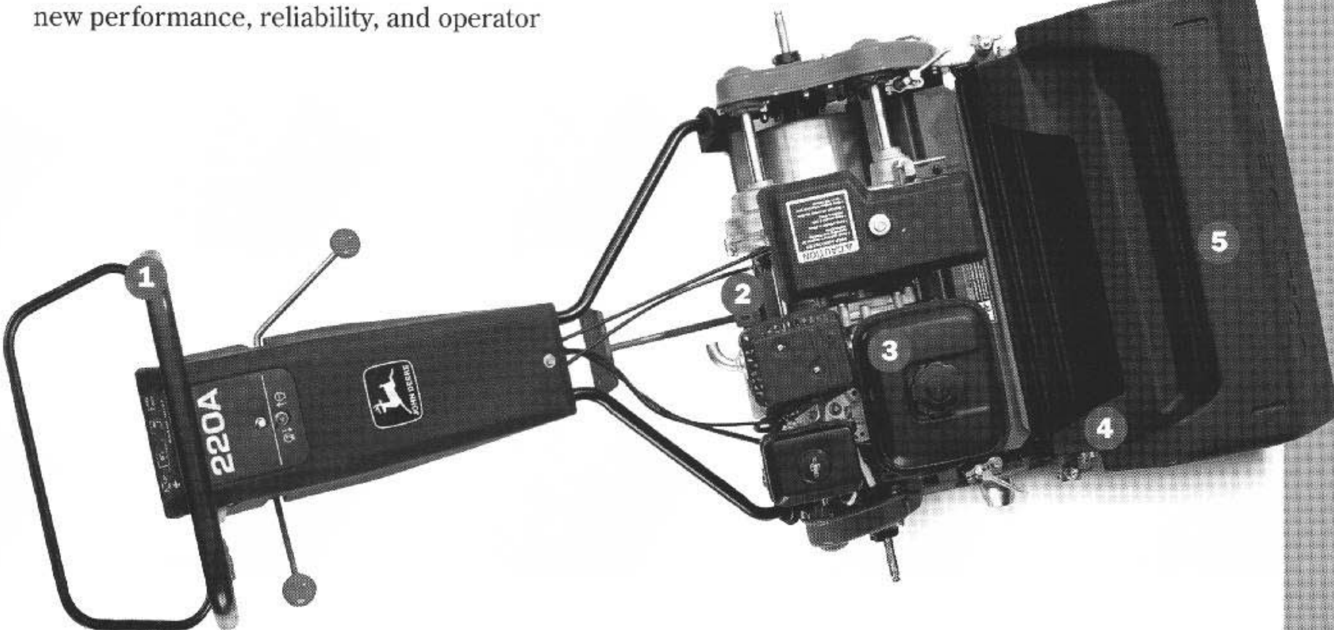

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(Continued from page 33)
Prairie du Chien, which meant he wouldn't be going back to the family farm at Hickory Hill. And, like so many before and after him, he fell in love with the University of Wisconsin campus in Madison. John worked in Prairie du Chien for about three months, and on February 6, 1861 he enrolled at the great State University of Wisconsin.

He was interviewed by Dr. John Sterling, a professor and namesake of Sterling Hall. Since the school was only 13 years old, John had the unique opportunity to become familiar with men whose names are now legendary—Barnard, Lathrop, Carr and Sterling. He lived in the northeast corner of North Hall—still in use today on Bascom Hill overlooking Lake Mendota. He quickly fell in love with this beautiful large lake, the same one I look at nearly every day from my golf course on its south shore or from my house on the north side of it.

Muir never forgot the University or Lake Mendota. He swam in it frequently and made countless walks along its shores, looking for bluebirds and robbins and bobolinks and thrashers—"gushing, gurgling, unexhaustable fountains of song..." Many times lately, while at our pump station or at the marina, I have wondered if John Muir made it down this far on Lake Mendota's shoreline, probably about a mile from the western edge of the campus.

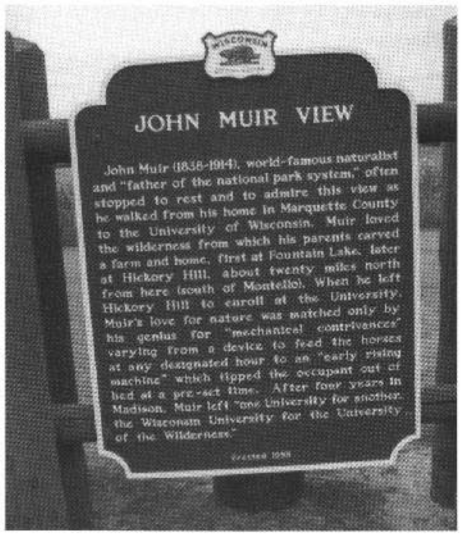
It was on campus Muir learned the large black locust trees were botanical brothers to the small pea plant, a discovery that led him to become a fanatical botanist the rest of his life. To him it was incredible that both plants were legumes.

Muir stayed at the UW-Madison until his junior year and then dropped out at age 25. From a hilltop on campus near Lake Mendota, "with streaming eyes I bade my Alma Mater farewell." Thirty-four years later John Muir returned to Madison to receive an honorary degree from Wisconsin.

Muir left Madison to make history like few other natural scientists ever have, or ever will for that matter. His legacy includes authorship of many many books, the founding of the Sierra Club (he was its first president), the Muir Woods north of San Francisco, and the John Muir Institute. He started the National Parks system and was a friend and advisor to presidents. A glacier is named for him, as is a mountain peak. Books have been written about John's awesome and monumental accomplishments. And even though he was decades his senior, Ralph Waldo Emerson said few inspired him like Wisconsin's John Muir

Yet to the end, he remained a simple man, often giving advice that rings especially clear for golf course superintendents like you and me:

"Keep close to Nature's heart, yourself; and break clear away, once in awhile, and climb a mountain or spend a week in the woods. Wash your spirit clean..."



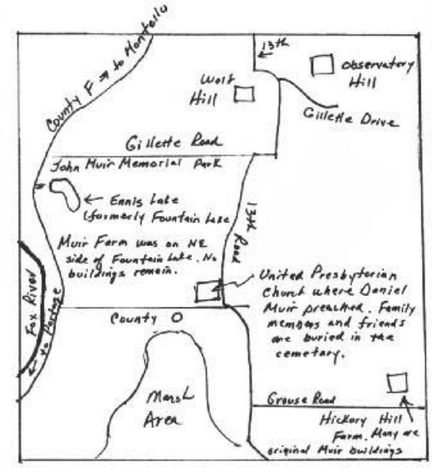
John Muir View roadside marker south of Pardeeville.

The John Muir view outside of Pardeeville.

If you don't have a week to "wash your spirit clean", take a few hours and go to the Montello area and visit Muir Park, see the old Presbyterian church (a kirk, as the Scottish call it and as the sign above the door says) his father preached in, walk around Fountain Lake (now Ennis Lake) and drive past the Hickory Hill Farm. You can climb Observatory Hill like John did many times in his youth (ask permission first) and sit a bit and read his words and contemplate what this Wisconsin boy has meant to mankind.

You won't be the same after you do.

Daniel Muir built the Hickory Hill farmstead in the center of his land to save time walking to the fields.



MAP to significant sites in John Muir's boy hood; Marquette County, Wisconsin.

An Investigation of the Salt Tolerance of Turfgrasses

By Bradley A. Smith

INTRODUCTION

Soil salinity can be a significant problem for turf managers, particularly in the western half of the U.S. In arid or semiarid regions, natural precipitation is too low to leach soluble salts from soil, salts may be blown in from salty bodies of water, and the irrigation water, including sewage treatment plant wastewater, often contains significant quantities of salts (Harivandi et al., 1992). In Wisconsin, salinity problems arise primarily from the use of deicing salts on roadways, sidewalks, and parking lots.

There are three main causes of salt injury in turfgrasses. First, excess soluble salts in the root zone can increase to the point where water uptake is restricted. This results when the salts in soil increase to the point where the osmotic pressure of the soil water exceeds that of the plant itself. In essence, the turfgrass plants then become drought stressed despite adequate amounts of water in the soil. Second, accumulation of salts in the turfgrass plant can limit normal uptake of essential nutrients, eventually causing deficiencies. Finally, if the percentage of the soil's cation exchange capacity occupied by sodium exceeds about 15%, soil clay particles may begin to disperse. These particles then migrate downward, fill in soil pores, and disrupt soil drainage. Over time, the problem becomes so severe that turfgrasses can no longer survive (Harivandi et al., 1992).

Turfgrass species and cultivars differ in their salt tolerance. These differences arise for three reasons: differences in ability to adjust tissue osmotic pressure according to the osmotic pressure of the soil; differences in capacity to regulate ion uptake and avoid toxicity; and difference in the ability of plant protoplasm to oppose harmful effects of accumulated ions (Harivandi et al., 1992). These are the attributes that provide the basis for plant breeders to improves turfgrass salt tolerances.

Turfgrass salt tolerance is difficult to assess. Results from laboratory and greenhouse studies can be quite different from what is observed in the field. The environmental stresses often encountered in the field contribute to the problem. Stresses due to drought, temperature extremes, nutrition or disease pressures make turfgrass more susceptible to salt injury. These are the reasons why this investigation was conducted under field conditions.

METHODS

The present study was set up on the University of Wisconsin-Madison campus in a 108 by 10 foot strip of land located between a well traveled street and an adjacent sidewalk. Both the street and sidewalk receive frequent salt applications during winter by the University Physical Plant. Typical applications are 200 to 300 pounds of sodium chloride per lane mile and 3 to 5 gallons of calcium chloride per ton of sodium chloride. This equates to 2.15 to 3.23 pounds of sodium chloride applied to the street bordering the research area.

Eighteen different turfgrass treatments were selected (Table 1) and planted in the research area in the fall of 1996. Futerra mulch was used to improve germination and prevent seed wash. As winter approached, temperature recorders were inserted into the soil in five distinct locations. The recorders were placed near the edges of the sidewalk and roadside curb, 12 inches from the sidewalk, and in the center of the plot area. The purpose was to see if there were any correlations among soil temperature, soluble salt concentration, and turfgrass salt injury.

As the snow and ice began to melt in spring, color/quality ratings of

Table 1. Turfgrasses tested for salt tolerance.

Treatment	Specie	Cultivar(s)
1	Slender creeping fescue	Dawson
2	Slender creeping fescue	Seabreeze
3	Slender creeping fescue	Barcrown
4	Creeping red fescue	Jasper
5	Creeping red fescue	Salty
6	Chewings fescue	SR 5100
7	Chewings fescue	SR 5000
8	Chewings fescue	Bridgeport
9	Hard fescue	SR 3000
10	Hard fescue	Scaldis
11	Hard fescue	Reliant
12	Hard fescue	Nordic
13	Perennial ryegrass	Manhattan II
14	Alkali grass	?
15	Kentucky bluegrass	Park
16	Boulevard lawn mix	Dawson, Alkali grass, Dimension, Geronimo, Cannon
17	Kellogg's salt tolerant mix	?
18	Wis. DOT mix	Salty, Reliant, Jamestown II (Perr. rye)

the turfgrass were taken for each plot. A scale of 0 (unacceptable quality) to 9 (excellent quality) was used for the ratings. The plots were rated for percent ground cover and the seed lots tested for germination. After the soil had thawed, samples were collected 2 inches and 2 feet from the sidewall and street and analyzed for soluble salts (saturated soil electrical conductivity) and exchangeable cations.

RESULTS AND DISCUSSION

Analysis of the soil samples collected in April revealed pH values of 7.3 and 7.6, electrical conductivities of 3.5 to 3.8, and sodium saturations of 1.3 and 17.4% (Table 2). According to Richards (1954), these electrical conductivities should reduce the yields of only the most salt-sensitive crops, a group that includes a number of landscaping plants, but not turfgrass. On the other hand, the 17.4% sodium saturation is in the range where soil clays begin to disperse and create impermeable soils.

Table 2. Soil analysis in April 1997.

Soil analysis	Distance from sidewalk: 2 inches	12 inches
pH	7.6	7.3
Electrical conductivity, mmhos cm^{-1}	3.5	3.8
Exchangeable cations, me 100 g^{-1}		
Ca	10.25	10.75
Mg	4.50	4.92
K	0.48	0.41
Na	3.22	2.43
Percent Na saturation	17.4	13.1

Table 3. Turfgrass germination and ground cover.

Treatment	Cultivars	Germination	Ground cover: March 12	April 2
		%	%	%
1	Dawson	83	93	95
2	Seabreeze	79	40	60
3	Barcrown	76	48	55
4	Jasper	85	51	66
5	Salty	ND†	63	75
6	SR 5100	94	43	55
7	SR 5000	74	45	45
8	Bridgeport	89	61	70
9	SR 3000	75	39	48
10	Scaldis	85	42	60
11	Reliant	27	10	33
12	Nordic	100	45	65
13	Manhattan II	ND	63	90
14	Alkali grass	0	—	—
15	Park	10	22	30
16	Boulevard lawn mix	27	30	40
17	Kellogg's mix	76	40	55
18	Wis. DOT	41	70	83

†ND = not determined.

Percentages of ground cover on March 12 ranged from a low of 10 for Reliant hard fescue to a high of 93 for Reliant slender creeping red fescue (Table 3). Increases in ground cover between March 12 and April 2 indicate ability to recover from salt injury and ranged from 0 to 27%. Thus, there appeared to be substantial differences in turfgrass salt tolerances.

Because some of the turfgrass seed was known to be more than 1 year old, germination tests were run to see if this could account for some of the differences in ground cover. As shown in Table 3, seed viability ranged from 0 to 100%. Unfortunately, alkali grass was the one found to have zero viability. Alkali grass (*Puccinellia* spp.) is reported to be the only truly salt-tolerant turfgrass species (Harivandi et al., 1992).

The germination data clearly show that this has to be taken into account when interpreting the estimates of ground cover. This was done by calculating the percent ground cover per percent seed germination (Table 4). Based on these values for March 12, the grasses tested might be separated into the following groups:

<u>Very low salt tolerance</u>
SR 5100
Scaldis
Reliant
Nordic

<u>Low salt tolerance</u>
Seabreeze
Barcrown
Jasper
SR 5000
Bridgeport
SR 3000
Kellogg's Mix

<u>Moderate salt tolerance</u>
Dawson
Park
Boulevard Mix
DOT Mix

A second measure of salt tolerance is the increase in ground cover between March 12 and April 2. These increases are presented in Table 4 in the form of the ratio of April:March ground cover. From this perspective, Reliant hard fescue was outstanding. Grasses showing the

(Continued on page 39)

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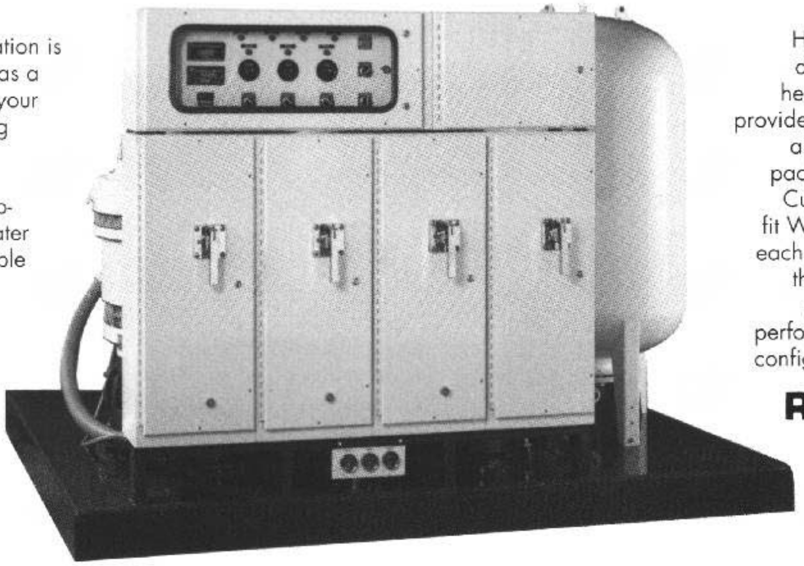

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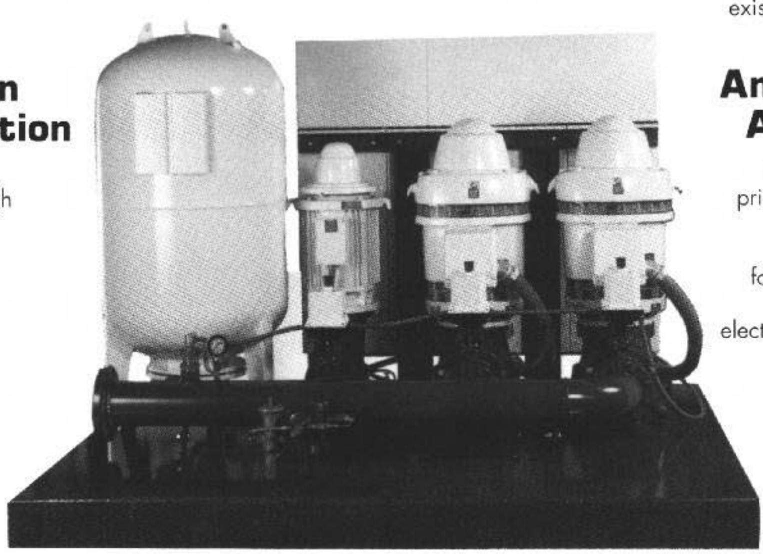

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(Continued from page 37)
least amounts of regrowth were Dawson and SR 5000.

Turfgrass salt tolerances are generally assigned by species. In this study, when the averages for the fine fescues (Table 4) were calculated, the relative salt tolerances were slender creeping red fescue > creeping red fescue > hard fescue = chewings fescue. Actually, the latter three species appeared to have essentially the same level of salt tolerance. These rankings agree with those of Harivandi et al. (1992).

The results of this study point out some of the problems in testing turfgrasses for salt tolerance. For reasons cited earlier, testing has to be done under field conditions where other stresses may be present. But the research is then subject to annual variations in the amounts of deicing salts applied and variable winter and spring weather. Lastly, seed viability must be taken into account during the first year.

Table 4. Percent ground cover per percent seed germination

Treatment	Cultivar	Ground cover/germination March 12	Ground cover/germination April 2	Ground cover/germination April/March
1	Dawson	1.12	1.14	1.02
2	Seabreeze	0.51	0.76	1.49
3	Barcrown	0.63	0.72	1.14
4	Jasper	0.60	0.78	1.30
5	Salty	—	—	—
6	SR 5100	0.46	0.58	1.26
7	SR 5000	0.61	0.61	1.00
8	Bridgeport	0.68	0.79	1.16
9	SR 3000	0.52	0.64	1.23
10	Scaldis	0.49	0.70	1.43
11	Reliant	0.37	1.22	3.30
12	Nordic	0.45	0.65	1.44
13	Manhattan II	—	—	—
14	Alkali grass	—	—	—
15	Park	2.20	3.00	1.36
16	Boulevard lawn mix	1.10	1.48	1.34
17	Kellogg's mix	0.53	0.72	1.39
18	DOT mix	1.70	2.02	1.19

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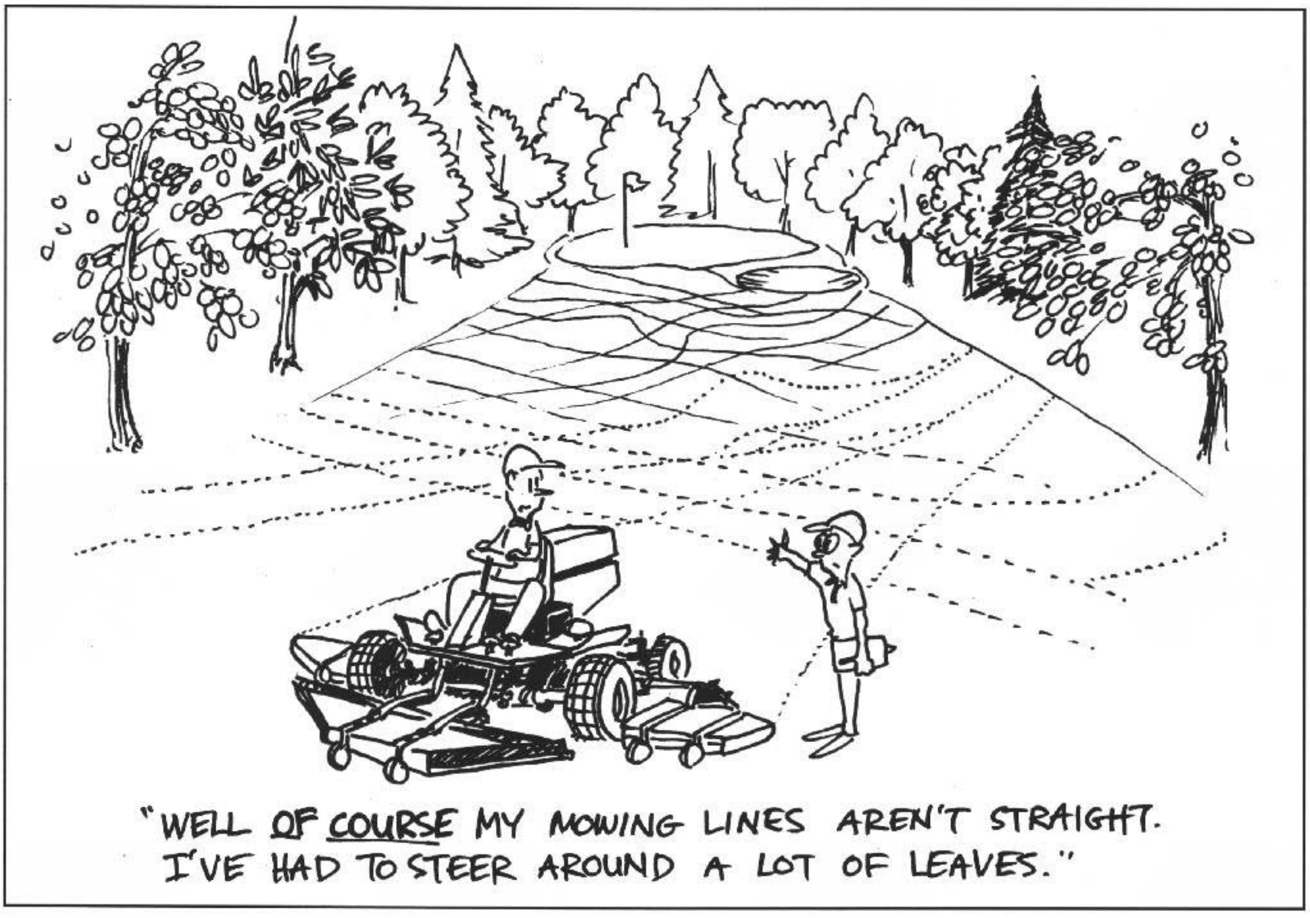
Editor's Note: Brad is a May 1997 graduate of the University of Wisconsin-Madison Turf and Grounds Management Program. He is employed as Assistant Superintendent, Lafayette Club, Minnetonka Beach, MN.



An Interesting Old Golf Course Book

By Monroe S. Miller

It seems I've spent an inordinate amount of my free time over a lot of years in antique stores and used book shops looking at old books. Weird as it sounds, I like buying an old, used book even more than a new one. Old books have a better feel to them and they smell really good; there is an appeal to owning a book that has a history of its own.

There may be something more to this, as a recent article in the British medical journal *The Lancet* reports. The fungi that feed on old paper may be mildly hallucinogenic and the fungal hallucinogens may cause an "enhancement of enlightenment" in readers. Wow! That news sort of makes me think twice about putting my nose in any old book again....

Except at least for one. I found a very interesting old golf course book in Tom Harrison's golf course library in his new shop. Let me tell you about it.

GOLF COURSES: Design, Construction and Upkeep is the 1950 second edition revision to the 1933 first edition. It was edited both times by Martin A.F. Sutton, and he gathered some gifted collaborators to discuss golf courses. Foremost among them were Bernard Darwin and Robert Trent Jones.

It is a British book, and all but Jones are English authors. The views brought to the subject of golf course care from the lands where golf got its start adds to the interest of this book. It is a point of view a bit different than we are used to experiencing.

The second World War and its economic implications restricted the playing of golf for five or so years and you could argue shortened the real time (17 years) between the first 1937 edition and the second 1950 edition. On the other hand, rapid advances in science and technology required by the war stretched that time—phenoxy herbicides come to mind first. Also, during those 17 years the cost of the game greatly increased. One result was smaller greens; another was fewer bunkers.

The book, from Darwin's introduction, laments courses lost to airfields, "pre-fab" housing tracts and more. But those years, on the other hand, saw great advances in implements and equipment—steel shafts necessitated longer holes (and therefore more tees), the introduction of the wedge club reduced scores, and Darwin also noted the increased strength of players and their willingness to put in long hours of arduous practice.

This was a time of no golf cars, and Darwin noted how "the interest of the walk" could be enhanced by knowledge of grasses and roots and soil. Therefore, he recommended players read the book!