

**THE BULL SHEET, official publication of the
MIDWEST ASSOCIATION OF GOLF COURSE
SUPERINTENDENTS.**

1986 Board of Directors

President	Dave Behrman (Chris) Deer Creek G.C.	Home: 672-5887 Office: 672-5887
Vice-Pres.	Jim Evans (Debby) Turnberry C.C.	Home: 815-455-3994 Office: 815-459-8570
2nd Vice-Pres.	Mike Nass (Jean) Bryn Mawr C.C.	Home: 297-7063 Office: 677-4112
Sect'y.-Treas.	David Meyer (Penny) Indian Lakes C.C.	Home: 820-1040 Office: 529-0200
Exec. Secretary	Penny Meyer (Dave)	Office: 820-1040

MAGCS Mailing Address

P. O. Box 390, Bloomingdale, IL 60108

Board	Sean M. Daley Ridge C.C.	Home: 388-5781 Office: 233-8490
	Alan Fierst Oak Park C.C.	Home: 456-7815 Office: 453-7525
	Ray Schmitz (Jan) Flossmoor C.C.	Home: 815-469-2773 Office: 798-2498
	Phil Taylor (Marilyn) Sugar Creek G.C.	Home: 279-8038 Office: 834-3325
	Bruce Williams (Roxane) Bob O'Link G.C.	Home: 680-1074 Office: 432-0088
	Joe Williamson (Sandy) Briar Ridge C.C.	Home: 219-322-1409 Office: 219-322-3660

ECKHOFF AWARD

For Excellence In Golf Journalism



We are not copyrighted and would like to share our articles with any who would like to use them, but please give the author and "The Bull Sheet" credit.

Editor —

Fred D. Opperman, CGCS
1022 Shady Lane
Glen Ellyn, IL 60137
Phone (312) 469-3444

Bull Sheet printed by Ever-Redi Printing, 5100 East Ave., Countryside, IL 60525.

The **Bull Sheet** is published once a month. All articles are required by the 10th of the month to make the next issue. Advertising is sold by the column inch, by the quarter page, half page, and by the full page. All artwork to be finished and in black and white. Circulation is around 500 issues per month.



President's Message

As I write this month's message the one thing on my mind is organizing for the trip to San Francisco and the 57th International Golf Course Conference and Show. I hope all of you were able to attend, the GCSAA prepared another exemplary program.

Of course as you read this you are just returning to work and plowing through the mail left during your absence. If you have been on an extended vacation you might even find your MAGCS dues notice in the pile. If this is the case you are late. Dues were due on or before the 1st of January, 1986. Those of you who did not find your dues notice might also want to check and make sure that they have been paid. I mention this because at the December 5th meeting of the Board of Directors of the MAGCS a motion was made and passed concerning dues. The gist of which is as follows: Any member who has failed to pay their dues for any reason as of March 1st (60 days past due) will be removed from the membership role and will be required to re-apply as a new member paying all fees including the standard application fee, if said person desires to be a member of the MAGCS. This measure was passed to facilitate bookkeeping and to enable us to produce an accurate directory. The board thanks you for your cooperation.

On another note, I find it necessary to make the membership aware that the MAGCS has an employment committee. The purpose of this committee is to assist golf courses who are entering the process of hiring a new golf course superintendent. The committee goals are to help the club establish what abilities the position demands, give information concerning the compensation levels currently existing for such a position, and make the club aware of the high caliber of individuals available in the Chicago area. This is **not** a job placement service, the committee serves the entire membership and strives to make the job market in Chicago fair and competitive. My reason for relaying these facts is to let everyone know that it serves the best interests of all concerned that if you are leaving a position or a club has asked for your assistance concerning an opening, that you refer the clubs search committee to the MAGCS employment committee. Such action will strengthen the role of the MAGCS in Chicago and help the club insure that its opening receives maximum exposure, enabling all qualified individuals to participate in the selection process.

Finally, I would like to take this opportunity to congratulate the newly elected officials of the GCSAA. Their election represents a tremendous amount of dedication and interest in the future of our profession. Their efforts in the next year will play an intricate part in the continuing advancement of golf course superintendents as a whole. Let us all ask in our own way that they receive the wisdom and guidance necessary to lead us to new heights.

David R. Behrman
CGCS

MAGCS Directors Column

Problem Solving Techniques

by Jim Evans, Supt.

Turnberry Country Club, Crystal Lake, IL

The GCSAA and MAGCS recently held two regional seminars at Pheasant Run Resort in St. Charles, IL. This is the fourth consecutive year that I have attended, and each year I am more impressed with the quality of course material and instructors. Pete Leuzinger, Betsy Evans and everyone else involved, especially Dr. Steven Hazel who presented the communications seminar should be commended on a job well done. Also, the entertainment after Mondays' session was a nice touch, I know it will keep me coming back.

Continuing education programs are important to us as superintendents. But the pertinent information learned at a seminar or conference may eventually be forgotten unless it is incorporated into some facet of our management program. In this article, I will outline a problem solving technique that was presented in the Business Communications and Assertiveness Techniques Seminar. Utilizing this seven step method, I will present a problem common to many of us in golf course management and then try to solve the problem in a logical manner. Hopefully, this technique can be useful to you in solving problems in your business.

1. **Define the Problem** — State exactly what the problem is. Example: Excessive thatch and mat accumulation on putting greens.

2. **Generate Solutions** — List as many solutions as possible.

Solution 1: don't do anything

Solution 2: implement cultural practices to gradually reduce thatch

Solution 3: remove sod and thatch with sod cutter and replant

3. **Evaluate Solutions** — Think of the results of each solution.

Solution 1: Don't do anything

Good results: less work for you and employees, doesn't disturb the membership, doesn't cost anything

Bad results: continued poor turfgrass quality, continued poor putting qualities, continued thatch buildup

Solution 2: Implement cultural practices to gradually reduce thatch

Good results: reduced thatch quantities, improved turfgrass health and quality, firmer putting surface, better putting qualities

Bad results: increase in maintenance budget expenditures, temporary poor putting surface

Solution 3: Remove sod and thatch with sod cutter and replant

Good results: achieved objective of removing thatch, installation of better plant variety, firm, high quality putting surface

Bad results: greens will be temporarily closed, poor putting surface for extended period of time, big increase in expenditures (initially)

4. **Choose Desired Results** — The best results would be:

— firm, high quality putting surface

— improved turfgrass health and quality because of a reduced thatch level

— minimum disturbance to the golfing membership

— the least amount of time, money, and effort expended

5. **Choose Solution(s) That Lead to Desired Results** — There may be one clear-cut solution, or there could be a combination of two or three solutions. In this case, I will choose only solution 2: Implement cultural practices to gradually reduce thatch.

6. **Choose Steps That Achieve This Solution** —

Step 1: Measure thatch depth on each green and record (avg. 20 samples per green)

Step 2: Test thatch layer for pH, essential elements, total exchange capacity, % base saturation, etc.

Step 3: Test underlying soil for same as Step 2.

Step 4: Evaluate soil and thatch tests and implement a fertility program to correct toxicities or deficiencies.

Step 5: Select cultural practices that will cause a reduction in thatch quantity.

Step 6: Determine proper time schedule for implementation.

Step 7: Implement vertical mowing two directions on each green at two week intervals throughout the growing season to control grain and remove stems, tufts, and coarse leaves.

Step 8: Implement vertigrooving heavily in spring and fall to remove plants and thatch.

Step 9: Implement core aeration in spring and fall.

Option 1: remove plugs and discard

Option 2: grind plugs and drag back into aeration holes

Option 3: remove plugs and stockpile for later use, let the plugs compost, then shred plugs, add fertilizer, soil amendments, etc., mechanically mix, and use for top dressing over newly aerified greens.

This process may have some advantages:

1. by using the same material for top dressing that the greens were constructed with, you will provide good uniformity throughout the soil profile.

2. won't allow the introduction of a foreign soil topdressing material which could create layering.

3. no need for purchasing topdressing mixes or sand

4. allows for the physical removal of thatch.

Option 4: remove plugs and add amendments, i.e. sand, soil, peat, calcined clay, etc.

Step 10: Implement topdressing throughout the growing season with properly selected materials that will avoid the production of layering.

Step 11: Select proper greens mowing equipment, mowing speed, reel speed, and mower weight necessary to provide the desired cutting results. These factors may have a significant effect on bentgrass thatch production and graininess.

Step 12: Avoid application of materials that have been found to reduce earthworm populations, soil bacteria, the soil macro and micro fauna that are responsible for the breakdown of thatch and organic debris.

7. **Evaluate Outcome of Solution** — Each year in the fall when you are core aerifying the greens, measure the thatch from 20 plugs on each green and get an average thatch depth for each of the greens. Record this information and compare the measurements from year to year. Determine if the above recommended program has helped decrease thatch levels over a five to ten year period, while improving turfgrass quality and playability. Your golfing membership will also be a good indication of the success or failure of your program.

Conclusions — This method of problem solving could be used quite effectively to aid in solving many problems that

(cont'd. on page 4)

(Problem Solving cont'd.)

superintendents confront. This procedure, if done correctly and thoroughly, could turn a tough, complicated decision into a relatively easy one.

Advantages: Provides a clear picture of all the options you have and clearly points out the best solution. Once you have a solution you can list all the detailed steps necessary to achieve the solution. Placing everything in writing will help you to determine if the list is complete and in order. This plan will clarify the facts for greens chairmen, board members, golf pros, golfing memberships, etc., when trying to convince them of a program change. It aids the superintendent and assistant superintendent in the scheduling and coordinating of maintenance practices throughout the golf season.

Ripen Winter Tomatoes at Home

Why do home grown tomatoes taste so much better than those from the local supermarket?

The main reason may be that we rarely pick home grown tomatoes before they are fully red or we pick them and ripen them before use.

Why, then, do we spend a buck a pound for winter tomatoes and complain about them when the solution is so obvious?

According to James A. Fizzell, University of Illinois Horticulturist in Cook County, no one should be disappointed by the pale-pink hard tomatoes appearing in the supermarket now. While winter tomatoes are shipped before they are ripe, they will ripen if given a chance.

Winter tomatoes are picked at the mature green stage when the full-sized fruit has turned from dark to light green.

At this stage the plant has done all it can for the fruit. In fact the tomatoes picked at this stage are higher in vitamin C than they would be if vine ripened.

The mature green tomatoes are only partially ripened before shipment because fully ripened fruit would arrive at market as tomato paste. Most of the tomatoes on the market now are from Mexico and Texas.

Fizzell says ripening can be done at home easily if you buy tomatoes a few days before you need them.

Tomatoes ripen best at between 65° and 70°F. Below 65°, the fruit will usually go soft without ripening so don't put unripe tomatoes in your refrigerator. Humidity of about 90% is ideal.

The easiest way to ripen up tomatoes is to put them in a colander or perforated plastic bag in a warm bright place. Direct sunlight isn't necessary for proper color development. Sort through the tomatoes daily and use or refrigerate those that have ripened.

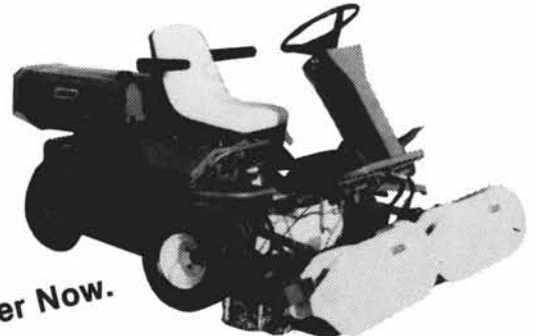
If you keep a few tomatoes on hand to ripen you will always have one of those bright red beauties when you need one. Winter tomatoes are expensive. They are worth the trouble it takes to get the most satisfaction from them.



LESCO Greensmower

designed by and for
today's turf professionals

- 18 H.P. twin-cylinder Kohler Magnum engine for added power and long life.
- Hydraulic power steering for easy maneuverability
- Independent reel controls for multiple mowing patterns
- Reversible hydraulics to allow backlapping of individual cutting units while on machine
- Center post steering for added safety and ease in climbing on and off either side of machine
- Rocker foot pedal for raising and lowering cutting units
- Automatic starting and stopping of reels



Order Now.

(800) 321-5325
NATIONWIDE

LESCO

(800) 362-7413
IN OHIO

LESCO, Inc. • 20005 Lake Road, Rocky River, Ohio 44116 • (216) 333-9250



Huber Ranch Sod Nursery, Inc.

Route 41
Schneider, Indiana 46376

Complete Supplier of all
Your Golf Course and
Landscape Needs

- Penncross Sod
- Penneagle Sod
- "Executive" blend
bluegrass sod
- Vertagreen,
Milorganite, etc.
- Full line of NK Seed, etc.
- Full line of chemicals
- Sprayers, Spreaders &
Golf Equipment

All products are palletized
with local fork-lift delivery.

Indiana 219 / 552-0552

Chicago 312 / 641-2898

Schroeder's Nursery, Inc.



Host of the I.L.C.A. Field Day — August 6, 1986

TREES • SHRUBS • EVERGREENS

RICHARD A. SCHROEDER
DON VIRGENS
CARL DRAVIS

Specializing in Large Caliper Trees
We offer complete installation

TELEPHONE: 312 — 546-9444

23379 W. Route 60 — Grayslake, Illinois 60030
Located on Route 60 between Rt. 12 (VOLO) & Rt. 83 (IVANHOE)



B. Haney & Sons, Inc.

COMPLETE TREE SERVICE

- TRIMMING • SPRAYING •
- SELECTIVE CUTTING •
- STUMP REMOVAL •
- WOOD CHIPS •

WE "CARE"
FOR YOUR TREES

(312) 678-7809

3344 Lincoln St., Franklin Park, IL 60131

McGinty

BROS., INC.

LAWN CARE

Weed, Insect, Disease Control;
Fertilizing, Core-aerifying, Slit Seeding

HYDROSEEDING

TREE CARE

Tree Spraying, Feeding,
Surgery, Trimming, Removal

PRAIRIE SEEDING

3524 LONG GROVE ROAD
LONG GROVE, ILLINOIS 60047 (312)438-5161

PAR EX PROFESSIONAL PRODUCTS® with IBDU®...with IBDU/SCU®... with ADDITIVES.



PROFESSIONAL PRODUCTS for PROFESSIONAL TURFGRASS MANAGERS.

We formulate our products to satisfy the regional nutritional requirements of *your* turf. Many of these mixes contain our exclusive nitrogen source, IBDU®, or our exclusive mixture IBDU/SCU. We are now offering the best additives in our mixes: Ronstar®, Dacthal®, Balan®, Dursban®, Oftanol®, and others.

Check with your local Par Ex
Territory Manager or Par Ex Distributor.

par ex
PROFESSIONAL PRODUCTS

Territory Manager
Thomas E. Skinner
Keokuk, IA
319/524-8912

Turf Products Ltd.
West Chicago, IL
312/668-5537

Rowland's Equipment, Inc.
Barrington, IL
312/381-1084

RONSTAR® is a registered trademark of ROHME-POULENC, INC.
DURSBAN® is a registered trademark of DOW CHEMICAL, USA

DACTHAL® is a registered trademark of S.D.S BIOTECH
*OFTANOL is a registered trademark of the Parent Company
of Farben Fabriken-Bayer, GmbH, Leberkosen

Complete Golf Course Construction



DEL KOELPER DARRELL KOELPER

(312) 259-5827
(312) 359-6427
(312) 537-1770 (SHOP)

ARLINGTON HEIGHTS, IL

BROUWER Triplex-376 mower
TURF EQUIPMENT LIMITED A TRULY PROFESSIONAL TRIPLEX MOWER



For Quality Equipment, Service & Parts, Contact



**CHRISTENSEN
POWER
EQUIPMENT INC**

815-469-5898 MANHATTAN-MONEE RD.
FRANKFORT, IL 60423

Bent Sod That Fits Your Course To a Tee!

from tee to
green...

- PENNCROSS BENT SOD
- PENNEAGLE BENT SOD
- XL-100 BLEND SOD
- A FULL LINE OF LANDSCAPE SUPPLIES
- DECORATIVE STONE
- LANDSCAPE TIMBERS

Illinois' largest sod grower

HEIOD
nursery, inc.

3900 West 167th
Markham, IL 60426
312-596-7200



To Keep Your Course In Classic Condition, Use These High-Quality Products from **NOR-AM**



- **NITROFORM**• SLOW-RELEASE NITROGEN
Releases by slow bacterial action to provide consistent 38% nitrogen.
- **TURCAM**• INSECTICIDE
Controls a wide range of turf and ornamental pests.
- **PROGRASS**• HERBICIDE
Controls certain annual grasses and broadleaf weeds in ornamental turf.
- **DEL TIC**• INSECTICIDE
Gives fast knockdown and long-term control of fleas, ticks and other pests.
- **ACTI-DIONE**• TURF AND ORNAMENTAL FUNGICIDES
Controls a broad range of diseases on turf grasses and ornamentals
- **BANOL**™ TURF AND ORNAMENTAL FUNGICIDE
Controls pythium and phytophthora
- **PROXOL**• 80SP INSECTICIDE
Controls white grubs, sod webworms, cutworms and armyworms in fine turf.

NOR-AM
NORAM CHEMICAL COMPANY
Wilmington, DE 19803
THE FAIRWAY CLASSICS
to keep your course in top condition

John M. Turner
Sales Representative
Specialty Chemicals Group

(312) 985-6643

Survey of Sand Bunker Maintenance & Costs

Fred D. Opperman, CGCS
Glen Oak Country Club, Glen Ellyn, IL

Trying to tell you what it is going to cost you to maintain your sand bunkers is like trying to tell you what the weather will be like the next day, especially if you live in the Chicago area. I can't tell you exactly what the weather will be the next day, and I can't tell you the exact cost of maintaining your sand bunkers. What I can do is give you some average costs, some ball park figures, and some estimates of what I have found that it may cost you. There are so many variables to contend with such as: number of bunkers on course, degree of maintenance required, age of bunkers, steep slopes, no slopes, capes or bays, equipment required, man power, budget, weather, type of sand, where course is located, where you get your sand, cost of trucking, time of year, and on and on and on. Unfortunately, I have left out as many variables as I have just mentioned. I believe you may be getting the picture of what I am trying to point, that what I have to say about the cost of maintaining sand bunkers is not an absolute figure. But I do believe that you may have a better understanding of what the costs might be after this report.

I sent a survey to 16 private, 18 hole golf clubs. I picked private clubs and clubs with only 18 holes of golf for a comparison of sand bunker maintenance. The questions asked were: number of bunkers on course, how many hours required to rake bunkers per day, how many times per week are they raked during the golf season, how many men used, how many machines used, number of times the bunkers are edged, number of hours required to edge and trim, average rate per hour of manpower for bunker maintenance, if they knew the square footage of their bunkers, and how often the sand is added.

The results of this survey show that out of the 17 clubs, including my own club, they average 66 bunkers per club. With the low being 37 bunkers and the high being 39. The average hourly rate for bunker maintenance is \$4.50 per hour with the low rate of \$3.50 and the high rate of \$5.25 per hour.

The clubs average 4.8 hours per day to rake their bunkers. This is not man-hours but total hours for the job to get done. The next question was, "How many men were needed to rake the bunkers?" The average came out to 2 men. With this information, it costs, on the average of 9.6 man-hours per day and at the average rate of \$4.50 per hour will equal \$43.00 per time or day to rake sand bunkers.

Next question asked was, "How many times per week in season do you rake your sand bunkers?" The average is 5½ times per week during the playing season. Then this cost per week would be \$225 for bunker raking.

Another question asked, "Do you have soft or firm sand?" The results are: 10 had soft and the others had firm sand.

The next cost item on sand bunker maintenance is the number of times the bunkers are edged and the manpower and hours used for this chore. The average number of times they are edged is 3½ times per year. One club edges only once per year and another club stated that they did it 7 times. In the hours spent edging, there is a great difference from the low hours of 16 to the high of 320 hours, with the average of 90 hours to complete the job. At this point, I regret to add that I didn't ask the number of men needed to do this chore, so I do not have

an average from the group I surveyed. But from my own records it takes 20 to 25 hours with a crew of 4 to complete edging our 74 bunkers. If I use this figure, the cost using the 25 hours times 4 (which is the number of men used on the job), would equal 100 man-hours. Multiplying 100 man-hours by the hourly rate of \$4.50, equals \$450 per time to edge the sand bunkers. \$450 times the average of 3½ times per year that the survey states the sand bunkers are edged gives us a cost of \$1,500 per year.

Other added chores of maintenance of sand bunkers would be the shoveling up of sand that has been washed down after heavy rains and the raking of debris and leaves out of the bunkers. The weeding of traps I felt was done when the traps were edged. The question of shoveling up of sand was not asked in the survey, but through my own records over the past couple of years, we seem to do it on the average of 5 to 6 times per year. That is outside of the times that the bunkers are edged. In my own case, we use a Toro trap rake with a plow on the front to push up the sand. My man-hours for this chore average 12 hours, and the cost would be \$54 per time or yearly cost of about \$325. Of course, there are those times when we have all done it 3 to 4 times in one week.

To sum up the yearly costs of raking, edging, weeding, and pushing sand back up the slopes, we have the following costs:

\$225 per week for raking, times 20 weeks (during season) equals \$4500.

\$129 per week for raking, times 6 weeks (spring & fall) equals \$774.

\$450 per time for edging, times 3½ per year equals \$1575.

\$54 per time for pushing sand, times 6 per year equals \$324.

Average total cost per year equals \$7173.

With the total average maintenance cost of \$7,173, the average maintenance cost per bunker would be \$108 per year.

To be included in the cost of sand bunkers, you must add the equipment used for their maintenance. Mechanical power trap rakes will cost about \$7,300 per machine and the survey shows that most private clubs have two machines for a total of \$14,600. Besides the power trap rakes, you must have hand rakes, both for the golfers and for the crew. The cost of these rakes will run from \$4.25 to \$21.95, with the average rake costing \$10.75. With the average of 66 bunkers per course, you have an investment of \$4,257 in rakes for the bunkers, if you would put an average of 6 rakes per bunker. Add to this cost the number of rakes you have in your maintenance building and the number of shovels, and you can add another \$300 to the maintenance of sand bunkers.

You will also need the equipment to edge and weed your bunkers. There are various tools to use for this job - anything from a sod knife to a motorized trap edging machine to string trimmers.

Costs of these tools will run from \$35 for the sod knife/edger to \$325 for a power sand edger or string trimmer.

The next question, "Do you know the total area of sand in your bunkers?" Out of all of the clubs, only 6 knew the square footage of the bunkers. It is surprising to see the total area one has and the individual sizes of the various traps. Out of the 6 clubs, the average square footage was 140,000. The low was 93,600 and the high was 300,000 square feet of sand. With the average of 66 sand bunkers per course and the average of 140,000 square feet per course, the average sand bunker in our survey is 2,120 square feet. (cont'd. on page 9)



2 N 255 County Farm Rd. West Chicago, IL 60185
Phone: (312) 668-5537

PEERLESS FENCE CO.

3N381 Powis Rd.
West Chicago, IL

- Chain-Link Fencing
 - Wood Fencing
 - Special Gates
 - Driving Range Fencing
 - Tee Protection Fencing
 - Wood & Steel Guard-Rails
 - Golf Course Work Our Specialty
- 312/584-7710 **Hal Laman**

“Golf Course Work a Specialty”

LEMONT PAVING CO.

Lemont, IL 60439

Jim, Tracy, Ray Murphy

257-6701

**WHOLESALE
SUPPLIER for**



LAKE COOK
FARM
SUPPLY

Landscapers • Nurserymen • Golf Courses

- Turf and Agricultural Chemicals
- Common and Elite Turf Grass Seed
- Union Fork Tools
- Peat Moss — Bark — Mulches
- Root Lowell Sprayers
- Shaws and F.S. Fertilizers

**CUSTOM BLENDING OF BULK FERTILIZERS
OUR SPECIALTY**

*Pickup or Delivered from our Bulk Fertilizer Plant
Custom Fertilizer Spreading Available*

DISTRIBUTORS OF F.S. PETROLEUM PRODUCTS

GASOLINE • LUBE OIL • DIESEL FUEL



LAKE COOK FARM SUPPLY

PETROLEUM
DIVISION
101 E. MAIN ST.
LAKE ZURICH, IL 60047
540-0100

TURF
DIVISION
1214W NORTHWEST HWY.
PALATINE, IL 60067
991-4800

BULK FERTILIZER
PLANT
170 CEDAR AVE.
LAKE VILLA, IL 60046
356-9600

Specializing in Trees
of Distinction
at competitive prices.



Eugene A. de St. Aubin & Bro., Inc. Nurseries

P.O. Box No. 351, Kirkland, IL 60146
Phone 815/522-6662

NATIONAL CHEMSEARCH CORP.

1001 Craig Road
St. Louis, Missouri 63146

**GOLF COURSE IRRIGATION
SALES CO.**

Div. of Halloran & Yauch, Inc.
2040 Lehigh Ave., Glenview, IL 60025

**CUSTOM PUMP HOUSE
CONSTRUCTION & REMODELING!
IRRIGATION INSTALLATION
& REMODELING!
GOLF COURSE DRAINAGE SYSTEMS!**

Call Us For Your Golf
Course Irrigation Needs!

(312) 729-1625

(Survey of Sand Bunker cont'd.)

When asked when and how frequently they added sand the results were: 10 added sand as needed, 3 do it yearly, and the rest do it every 2-3 years. The average cost of sand replacement in the budgets was \$3,000 per year and the low budget was \$500, with the high being \$7,200 per year.

When asked if sand is just added to your bunkers, 11 responded yes and the others no.

So far, all I have discussed is the daily and seasonal maintenance of our bunkers and their related approximate costs. Now I would like to cover the areas of construction and the addition of sand to the bunkers.

One of the first items that might be done is to have sand samples that you are considering to use, be analyzed. The cost of sand analysis is rather inexpensive when you stop to consider the overall cost of adding sand to your bunkers, and you certainly want to make sure that you will be adding the right sand. The spring of 1985 I had three samples analyzed at a cost of \$150 or \$50 per sample plus shipping. Shipping costs were \$28 by UPS. If you are going to be spending thousands of dollars on sand you do want to be sure it is the proper sand for your bunkers. This analysis will give you both the sieve and mechanical analysis of your samples. One hint I have for you, if you have the time to send your samples in, try to dry the sand first to make it lighter for shipping. Most labs will ask for about a gallon sample, and this can get heavy if wet.

Now the cost of sand replacement. Again, all of the variables come into play: how many bunkers, what size, how far from the source of your sand, type of sand, where you are located, etc., etc.

I found sand prices per ton to vary from \$2.85 per ton to \$9.00 per ton. This price does not include shipping. Shipping prices depend on the distance from the source of the sand, how much competition in trucking is in your area, if you are located in the inner city, suburbs or boon docks, or if there is a return load the trucker may pick up. Some trucking firms will charge a flat fee of say \$1.75 per ton for the first couple of miles, then maybe \$.25 per ton after "X" number of miles. Again it is difficult to say what the cost of sand will be until all of the variables are checked.

To find out what the sand is going to cost you, you must first know how much sand will be needed. You had better find out the square footage of the trap or traps that will be requiring sand. Then you can figure out the tons of sand required.

To figure out the quantity of sand required, you should remember or jot down that:

1. Sand weighs about 96 pounds per cubic foot
2. One ton of sand will cover 22 cubic feet
3. This one ton of sand will cover 44 square feet at a depth of 6 inches or cover 66 square feet at a depth of 4 inches.

The formula to determine the amount of sand required in a sand bunker is this: length x width x depth needed (expressed in a decimal such as .5 = 6 inches, .33 = 4 inches, .25 = 3 inches) x 96 (which is the weight of a cubic foot of sand) divided by 2000 (which is the number of pounds of sand in a ton) will give you the total tons required.

With this formula then, if we take our survey results that state the average trap to be 2,120 square feet, and we have removed all of the old sand and need to replace it with clean sand to a depth of 6 inches, we need to multiply the 2,120 square feet

by the depth of .5 (which is 6 inches) and times that by 96 pounds per cubic feet. That figure then needs to be divided by 2,000 pounds to give us the 51 tons of sand needed to replace the old sand in the bunker. Fifty-one (51) tons of sand times an average price of say \$7.50 per ton will give us a cost of \$382 for sand in that one bunker. This cost is for sand alone with no labor included.

The cost of labor and equipment needed to remove sand from a sand bunker will run about \$800 to \$1200 per day for a loader tractor and 2 dump trucks if an outside contractor is hired. If sand is to be removed from a bunker, a crawler tractor, or at least a 4 wheel drive tractor, is needed if you are going to get any production out of the equipment. A regular tractor loader that most golf courses have will do the job, but it will be slow and the tractor will get stuck many times. If you are just doing a couple of traps, then the course tractor could be used and the cost would then be just the man-hours in labor involved. But to remove sand from many bunkers calls for the more specialized and heavier equipment that outside contractors would have.

Two clubs in our area did extensive remodeling the summer and early fall of 1985. I have some construction costs on sand bunkers that they were able to give me. The one club was charged \$2.74 per square yard for the shaping and grading construction. The 4" perforated or non-perforated tile was quoted at \$2.85 per linear foot. The installed price of 6" of bunker sand was charged at \$15 per cubic yard, including the labor to spread it. The finish grading, seeding and sodding was charged at \$2.95 per square yard.

The second club paid \$150,200 for 29 bunkers that had a total area of 72,670 square feet. This figures out to be about 2,500 square feet per bunker and the cost of construction for these bunkers came out to \$2.05 per square foot. This figure includes 4" drain tile with an average of 50 feet per bunker, a filter fabric, pea gravel backfill over tile and 6" of sand. Sod was laid all around the bunkers out to a distance of 6 feet and all else was seeded.

Many clubs are starting to use filter fabrics in lining their bunkers before placing sand in them. This prevents the sand from becoming contaminated from underneath. I have the cost of one club that kept records when doing one of their bunkers. The bunker size was 1800 square feet, and 39 man hours at \$5 per hour were used to do the following: remove the existing sand; re-contour to original outline; trench and tile; apply the fabric; which was terra bond, replace the sand; sod the banks; and clean up. The cost for this came out to \$542 in labor. They also figured in the costs of materials and equipment and this cost was \$195 for a total cost of \$737 for that one particular bunker.

Many other clubs have used a filter cloth in their sand bunkers, but they didn't keep detailed records of labor and supplies. A typical roll that would be 300 feet long by 6½ feet wide would cost about \$196. This would come out to about 9½ cents per square foot. For our average size bunker of 2,120 square feet the cost would be about \$200 or less depending on the square footage you might be doing. The more you use, the less the cost becomes when buying this product.

I feel that I have pretty much covered the costs of sand bunkers maintenance in this report, but for the most part the surface was just skimmed when I got into the cost of replacing sand and bunker construction.

How to get _____ more than _____ you pay for _____

When you shop around for turf equipment, you're out to get your money's worth.

Most dealers can give you a fair shake for your dollar.

We can, too. But what makes us different is that we also do a whole lot more.

One way is by offering you a complete line of turf care equipment so you have an option of good choices. The index in our catalog lists 76 product categories, and 38 different brand names. That's selection.

Behind the scenes we help you keep your equipment in tiptop shape. We have a fully stocked parts department.

And equipment repair and maintenance is handled by factory trained experts who know that you want your equipment back fast and in top running order.

There's even more. Maybe you're not in a position to buy now, even though you need new equipment now. We can probably work out a lease plan. Or something else.

Maybe you're not exactly sure about what products you need to do the job you want to get done. That's where our more than 32 years of experience comes in handy. We'll give you expert advice. And that's free.

If you prefer to do your own maintenance and repair work, we can even give you some pretty good advice about how to do it. And that's free, too.

Yes, we can give you a fair shake for your dollar. And you'll go away happy.

But we go out of our way to do a whole lot more. Just to keep you happy.

Because we don't want you to go away at all.



**illinois lawn
equipment inc.**

**illinois industrial
equipment co.**

MAIN OFFICE Orland Park, Illinois • 16450 South 104th Avenue • **312/349-8484**
BRANCH OFFICE Wheeling, Illinois • 291 East Messner • **312/459-7008**