

6. Leaves not cleaned out of traps before raking.
7. Rocks, sticks and other impediments removed on a daily basis.

There are many arguments about where trap rakes should be placed. The USGA rule permits rakes to be placed either in or out of the trap. For PGA or USGA events, "rakes should be placed outside the bunkers away from play," according to PGA Tour Agronomist Billy Buchanon in a recent telephone conversation I had with him. For most Milwaukee area clubs, the rakes are placed in the trap. A helpful hint that Wayne Otto, Golf Course Superintendent at Ozaukee Country Club, mentioned was the attachment of a decal to the handle of each rake with the following message: **Please leave in trap perpendicular to edge.**

At Tuckaway we have been cutting the spike off of the rakes so the golfer cannot stand the rakes up. Billy Buchanon suggested doing this for a reason that I hadn't thought of before. He said that by removing the spike, you may help prevent the membership from an accidental penalty. He pointed out that it is a two stroke penalty if a player tests the condition of the sand before striking the ball.

The survey showed that for the clubs with large number of traps it takes more than 300 labor hours to knife-edge the bunkers. For a crew of 3 to 4, it can take weeks to get the job done. The job quickly turns into drudgery. Jerry Kershasky of Westmoor Country Club developed a procedure to help take some of the drudgery out of this important work. He divides his crew into 4 teams of 4 people. Each team edges for 2 days at a time. A contest is set up among the teams to see who can do a fast and efficient job. Jerry is the sole judge. The winning team members each get a \$25 bonus. Second and third place teams get \$10 and \$5 respectively. The last place team gets to do the next undesirable job that comes along during the season.

I'm not supposed to cover the anything on construction, but a statement made by Carl Grassl is worth covering twice. For his crew it takes about twice as many hours for a unit of construction as it does a private contractor. However, the cost totals are approximately one-

half. I am assuming his crew is probably doing a somewhat better job.

One problem with sand bunkers is the attitude of the golfer toward them. They want them perfect so they don't suffer any unfair handicap. What they sometimes forget is that **they are supposed to be a hazard.** There is no way that we can change this attitude, however. So we will have to do as good a job as possible with the labor available to keep them perfect.

Bob Vanscoy, PGA Professional at Tuckaway, things we can, to a certain extent, change the attitude of the golfer. His idea is that basically some of the complaints the golfer has towards the trap are because of his inability to play the sand shot. Through proper lessons and practice, his ability to handle the shot will increase. As his confidence increases, his complaining will decrease.

In conclusion, the bunker survey can be used by one in many ways

to help support a given point. Most clubs think they have problem bunkers. Some bunker problems are ones under our control and some of them are not.

I have included the "Sand Bunker Survey" and the results I received. Also, I am including an instruction sheet given to our mechanical sand trap rake operators.

SAND BUNKERS SURVEY

- 1) *How many sand bunkers do you have on your course?*
Average 49, Range 20-77
- 2) *What is the total square footage of sand bunkers?*
Average 114,000, Range 50,000-187,000 (50% response)
- 3) *How often per week are your bunkers raked?*

Gelhar Sand

Serving Golf Courses Since 1919

Silica Sand-Washed, Screened and Blended to U.S.G.A. specifications.

Top dressing and Bunker Sand.

Chemical analysis of Washed Silica

Silica	99.941%
Iron Oxide	.018%
Aluminum Oxide	.012%
Calcium	.004%
Magnesium	.003%
Sodium	.001%
Potassium	.001%
Titanium	.001%

Silica Sand Top Dressing Screen Analysis

Mesh	% Retained
30	2.0
40	11.0
50	25.0
70	51.8
100	10.0
140	.2



P. O. Box 78 • Larsen, WI 54947
414-667-4792

- a) green bunkers average 4.9, range 3-7
- b) fairway bunkers average 4.75, range 3-7
- 4) For normal raking how many hours per day are spent on bunkers?
Average 5.8, Range 3-14
- 5) What is the average \$/hr. cost of personal raking traps?
Average \$4.06, Range \$3.35-\$5.25
- 6) How many times per season are the traps edged?
Average 3.7, Range 1-8
- 7) What method is used in edging and how many times for the particular method?
 - a) knife type mechanical edger, Average 1.8, Range 1-3
 - b) nylon string edger, Average 2.2, Range 0-6.5
 - c) others
- 8) Last season approximately how many times was sand shoved or pushed on traps?
Average 8.5, Range 3-15
- 9) How many hours does it take to edge the traps?
Average 125.3 hrs., Range 6-350 hrs., Average per trap 2.5 hr.
- 10) How many hours does it take to move sand up on the edge of the bunker?
Average 22.6, Range 3.5-41 hrs.
- 11) How frequent is sand added to bunkers?
Range as needed — once per year
- 12) What was the per ton cost of bunker sand F.O.B. at your club in 1985?
Average \$7.87, Range \$5.10-\$12.00/ton
- 13) What was the total cost of sand added to bunkers for 1985 season?
Average \$973.75, Range \$0 — \$3,000
- 14) How many mechanized machines are used on a regular basis for raking traps?
Average 1.5, Range 0-3
- 15) What manufacturer produces the machine?
Toro (16), Smithco (5)
- 16) How many years on the average is the mechanical rake kept before being traded?
Average 9.75 yrs., Range 3-15
- 17) How many hand trap rakes do you have on the course used

by golfers?

Average per trap 2.9

- 18) What term best describes the sand in your bunkers?
 - a) hard 6
 - b) soft 7
 - c) both 1

structed?
2,140 sq. ft.

- 4) What was the approximate construction cost per trap?
*average of 5 responding \$1.23/sq. ft. (range \$1.00 — \$1.48/sq. ft.)
*results of a sixth club was omitted because it varied widely from others responding

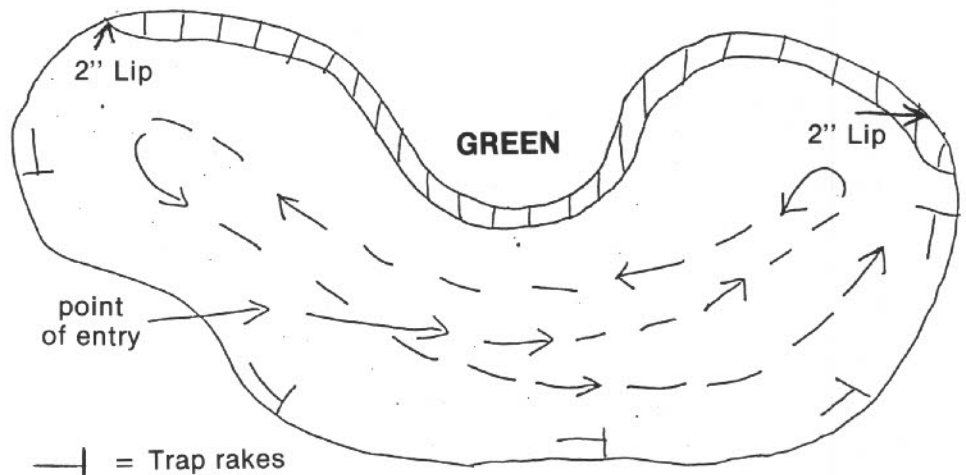
BUNKER CONSTRUCTION

- 1) In the past 5 yrs. have you added or filled in any traps on your course?
Added: 66 filled in: 21 (14 clubs)
- 2) In the next 5 yrs. do you project any bunker renovation?
Yes 13, No 1
- 3) How many square feet was the average trap that was con-

Construction expense variables:

- 1) Labor
- 2) On sight soil moving per yd.
- 3) Off sight soil moving per yd.
- 4) Drainage per ft.
- 5) Fiber blanket per yd.
- 6) Grading
- 7) Sand per cubic yard
- 8) Sod per sq. yd.
- 9) Rentals

SAND TRAP RAKING PROCEDURES



- 1. Fill gas and check oil daily; do not overfill
 - a. maintain full level on dipstick
 - b. blow out clutch daily on SMITHCO
- 2. Begin by handraking around the perimeter of the trap (green traps only). Clean up all sand that is out of the trap. Where sand is sparse in the trap, pull sand from an area with too much sand.
- 3. Begin machine raking in the center of the trap. Proceed in an outward circular direction.
- 4. The objective of raking is to provide a smooth and even surface for the membership. Do not leave a trap until that goal has been reached. NO GROOVES, ROCKS, GRASS,

- etc.
- 5. Leave no sand outside of the trap; i.e., clean up sand which the machine drags out.
- 6. All rakes should be placed **inside** the trap in a manner illustrated below.
- 7. Do not go in reverse with the rakes down because this gives Peter G. great heart-ache.
- 8. On Thursdays check to make certain a two-inch lip is maintained on green side traps. This does not mean the lip is to be erased on the other days, however.
- 9. Shut off motor if people (golfers) are on greens.
- 10. No one is finished until everyone is finished.