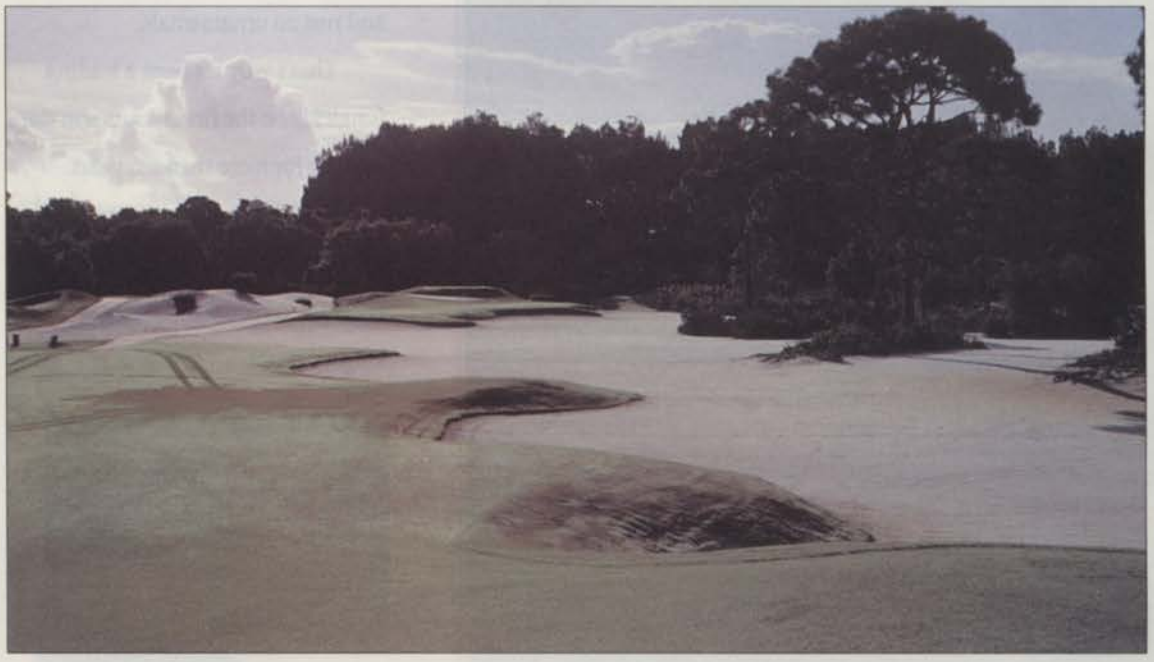
The art of bunker maintenance



Sand bunkers come in all shapes and sizes: large and small, regular and irregular. But they are generally areas of special maintenance attention, if you want your course looking sharp.

Nothing shows your course off better than clean, sharp lines in a well-raked bunker.

■ A "hazard" is any bunker, water hazard or lateral water hazard, say the Rules of Golf.

By definition, a bunker is an area of bare ground, *often* a depression, which is *usually* covered with sand. Grass-covered ground bordering or within a bunker is not part of the hazard. So that settles the issue of "TV grass bunkers." TV announcers and architects take note: no such animal exists.

Since bunkers have no stakes or lines, the margin must be defined by the separation of turf and sand. That's why bunkers require so much edging and raking. Sand and turf must be kept separate. Sand raked onto the turf makes it impossible for the player to determine if the ball lies in or out of the hazard.

Those maintaining bunkers must (1) provide the golfer with a consistent playing surface, and (2) allow the golfer to make a fair ruling in playing the shot.

Raking—Various methods and intervals are employed for raking bunkers, depending on budget, time and labor constraints.

(1) Hand—This is the best way to get a consistent surface and lie but it's labor- and time-intensive. Courses that hand rake are usually on a continuous schedule.

(2) Machine—This procedure is the quickest and cheapest. One or two persons can do the average 18-hole course in a day. The trade-off is a bumpier surface with tool marks that may trap a ball. Also, maneuvering the machine too close to the edges can beak down the banks and spill sand onto the turf. Budgets may only allow this procedure three times per week—but always on Friday. Use a hand rake to clean up behind the machine.

(3) Combination—A combination of machine and hand seems to be an effective alternative. The machine loosens the surface so it can be quickly raked. Hand-rake the edges. Let the operator continue around the course with a two-man crew following with hand rakes. This procedure may be restricted to twice a week and after each heavy rain.

Edging—No bunker looks maintained without some regular edging. Otherwise, the turf will close in and shrink the bunker, leaving an unsightly and unplayable margin. Your budget will tell you how much you can do.

How you edge and how much you edge will, again, depend on time and budget:

(1) Rotary edger—This is a quick and easy way to maintain the margins followed

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by hand-raking the trash left in the bunker. However, this method leaves the raw edge exposed unless the sand is brought to turf level, eliminating the desired lip. Require the operator to wear goggles.

(2) String trimmer—It does a fair job in the hands of a good operator, but it's difficult to maintain a clean and straight edge. It also leaves the turf with ragged edges. Hand rakes are needed to remove the trash in the bunker after this operation. Require your string trimmer operator to wear goggles.

(3) Hand edging—The preferred method, by far, because pulling the runners that protrude leaves the turf with a groomed look and lets it drape over the edge. Also, it's easier to draw the sand under this drape and leave a good margin. This procedure is also labor-intensive and adapted to higher-budgeted courses. Normally, this is done at each raking to maintain the groomed look.

Regardless of the method, rhizomes growing into the sand must be removed periodically. This takes the time-honored method of reaching into the sand four to six inches and pulling out the rhizomes. Left unattended, the bunker will close in and be unsightly. How often this needs attention depends on the species and season.

Drainage—The most vexing problem facing the superintendent in bunker maintenance is drainage. The three types of drainage designed into a bunker are: (1) internal; (2) surface; and (3) *no* drainage. The first, installed properly, gives the most lasting results. The second method starts out as a problem and gets progressively worse. The third requires your attention, *today*.

Drains must be kept open at all times; you never know when the next rain will hit. Following a heavy rain, water will percolate through the sand slowly, leaving a film of silt on the surface. The most important part of restoring your bunker is removing this layer. Skim it into piles and get it out before any raking, as you will contaminate the entire bunker.

Surface-drained bunkers will wash the sand onto the turf at the lower end (usually in front of the green) following a rain. This means shoveling the material off the surface and brushing the residual into the turf. The only permanent solution is to install drains in the bunker and carry the water away from the playing ground.

Not having any drainage may or may present an immediate problem, particularly if you have no sand in the bunker. That is not uncommon on many restricted budget courses. However, if you wish to provide a better playing surface in your bunkers, they will need some form of drainage. We shall discuss this next month.

—The author of this article, Al Frenette, CGCS, passed away in September, 1992. It originally appeared in "Through the Green," the publication of the Georgia Golf Course Superintendents Association, and is used with their permission.

On the cutting edge of bio-tech

New biological concepts and technologies will help golf course superintendents meet the future demand for quality trees, shrubs and herbaceous plants.

by Douglas J. Chapman, Dow Gardens

■ Trees, shrubs and bedding plants provide interest and color, often the difference between an average and an exciting golf course. To better develop the course while not increasing maintenance, a superintendent should be aware of biological concepts that affect the type of tree, shrub and herbaceous perennial to be planted.

Some of these concepts are:

- native plant adaption to high and/or low temperature,
- photo-period's impact on vegetative and reproductive growth,
- disease-resistant cultivars, and
- unique pheno types (growth habits).

Provenance is adaptation of plants to regional environmental conditions. As many golf course superintendents know, *Acer rubrum* is native from northern Michigan to northern Florida. But northern Michigan red maples will not survive high temperatures south of Kentucky. Conversely, southern ecotypes will not survive low northern temperatures.

Spirea blumalda

***Acer rubrum* 'Northwoods.'**

Further, as one moves north, native trees within the same species (plants in general) exhibit provenance by being more photo-periodic responsive (responsive to day length). Two results of this photo-periodic response are the beginning of abscission (dormancy) and hardening off (low temperature tolerance).

Photo-periodism was first discovered by Garnard and Allard in the late 1920s. Their basic research showed that some plants initiate a reproduction cycle by virtue of day length—like chrysanthemum, short days. As photo period was more extensively researched, it was shown that juvenile plants native to northern latitudes are more day-length responsive. When grown under continuous light, the plants remain vegetative. Some plants, like Japanese maple, Blumalda spirea, and paper birch can grow to at least three times their normal annual height in 12 months. The plant remains continually vegetative until it is allowed to go dormant by shutting off the supplemental light.

Using this technique, one can accelerate growth of many northern plants propagated by tissue culture, cuttage and/or seedage which dramatically reduces the time needed to produce landscape-effective conifers, birch and northern woody ornamentals.

Northern genotypes can be selected for unique habits of growth, fall color, etc. while being extremely low temperature hardy. Ecologists have shown that native