

# Touching Up The Mona Lisa

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**P**REPPING Pebble Beach for the 1992 U.S. Open has been a consuming focus for many months, and it will definitely remain the focus until this national championship event occurs in June. As an added consideration, our crew has spent the past year overcoming several years of drought on the Monterey Peninsula which had deteriorated the condition of Pebble Beach Golf Links in several ways. The predominant turfgrass, *Poa annua*, had expired to the point that fairway surfaces had become parched and unplayable. With the *Poa* continually under stress, it posed little competition to the extremely aggressive and invasive kikuyugrass (*Pennisetum clandestinum*). Kikuyugrass was running rampant, with stolons as thick as a pencil and virtually nothing to stand

in its way. Its population had increased to the point that it was dominating the holes along the coast and becoming a significant force in the remaining areas. At the same time, the 4th, 5th, and 7th greens were in disrepair and needed a facelift.

With the 1992 U.S. Open only 22 months away, the situation was becoming critical and considerable work had to be done. In September 1990, with the support of the Pebble Beach Company ownership, the United States Golf Association, the Monterey Peninsula Water Management District, and the architectural assistance of Jack Nicklaus Golf Services, the Pebble Beach Company embarked on a three-phase program to restore Pebble Beach Golf Links and prepare for the 1992 U.S. Open Championship.

**T**HE FIRST PHASE consisted of a large-scale kikuyugrass-control program and the establishment of a more desirable turfgrass species. The second phase was scheduled for the spring of 1991 and involved rebuilding greens 4, 5, and 7. The third and final phase was the "one hole at a time" kikuyugrass-control program around greens and tees, with bunker restoration, reclamation of putting surfaces, and the leveling and enlargement of tees being performed while the areas were renovated. Phase three was performed during the summer and early fall of 1991 with the intent of having all projects completed by the last week of October.

In a country club environment, when a decision to embark on a major project has been made, a majority of the

*To halt the aggressive kikuyugrass encroachment, fumigation with methyl bromide was used.*



membership has elected to undertake the project, and the entire membership has been informed of the process. At Pebble Beach Golf Links, course play is by resort guests and the public, most of whom have made reservations months, if not years, in advance. Because the decision to regrass the course was made somewhat spontaneously, and there was a lack of time remaining before the U.S. Open, it was not possible to inform incoming guests or to make plans to close the course during the project. As a result, restoration work and golf play had to co-exist harmlessly and, if possible, harmoniously.

**K**IKUYUGRASS control was initiated in September 1990. To accomplish the renovation goals, all kikuyu-grass had to be killed and the golf course reseeded with desirable turfgrass species. The most heavily infested areas, including fairways 3, 6, 8, 9, 13, and 16, underwent fumigation with methyl bromide. Fumigation was performed by an independent contractor, using technology developed for strawberry

fields in local agricultural operations. Methyl bromide, a gas at temperatures above 55° F, must be applied under a tarp to keep it from dissipating before it can do its work. The fairways were done in two halves, with the fumigated and tarped area roped off and posted with the appropriate signs. The roped areas were played as ground under repair, and a staff member was positioned at the site to retrieve balls landing on the tarp and to ensure that no one inadvertently entered the area. The tarps remained in place for 48 hours, and the area was allowed to air for 24 hours before the second half was fumigated. A total of nine acres were fumigated.

The remaining 90 acres of golf course, excluding the immediate area around the greens and tees, were sprayed with a tank mix of Roundup, ammonium sulfate, and Bivert. The green and tee banks were left unsprayed and acted as a buffer to avoid tracking Roundup onto the tee and putting surfaces. These areas were addressed in phase three.

Early in the development stage of the kikuyu-control program, a small silver

lining became apparent in this ugly cloud. As the *Poa annua* was suffering from its worst case of "Poa annua decline," the perennial ryegrass, seeded into the fairways while filling divots, became very evident. With virtually no irrigation, ryegrass was co-existing with kikuyugrass. Research conducted at the University of California - Riverside has shown that during renovation, the use of perennial ryegrass or tall fescue, because of their rapid establishment, produced the greatest degree of success. The ability of perennial ryegrass to tolerate several herbicides found to be detrimental to kikuyugrass growth, and the knowledge of the fine playing surface it provides, made perennial ryegrass the only choice for establishment as far as we were concerned. With the Spalding Pebble Beach Pro-Am Invitational two months away and the AT&T Pebble Beach National Pro-Am four months away, rapid establishment was essential.

With the herbicide and fumigation applications complete, it was time to make the golf course green again. Regrassing was addressed just like a southern over-

*Stay alive at 55°. A constant soil temperature will be maintained year round on the 5th green with the installation of the sub-surface heating systems.*





*Kikyugrass control around the greens and bunker renovation were done in the same phase.*

seeding. Seedbed preparation consisted of aggressive scalping, dethatching, and cleanup. The coarse stolons and thick mat of thatch made seedbed preparation particularly challenging. As seedbed preparation was completed, fairway areas were broadcast with 500 pounds of seed per acre and the roughs with 350 pounds per acre.

Tupersan, a preemergence herbicide identified by UC-Riverside to be effective in the control of kikyugrass seedling emergence, had been taken off the market but not banned from use. Our renovation effort was boosted by discovering 500 pounds of Tupersan in the chemical storage building. Tupersan was applied at the labeled rate for annual weedgrass control five days after the area was seeded. The application gave the perennial ryegrass seedlings about a 45-day head start over kikyugrass germination, and by that time, very little kikyugrass emergence occurred.

The perennial ryegrass germinated after seven days and established quite rapidly, with total grass cover occurring one month after seeding. With solid ryegrass in the fairways and roughs, the only kikyugrass still in play was surrounding the putting greens and tees. This problem would be addressed in the early summer when kikyugrass growth became active.

With the first hurdle out of the way, it was time to look at our problem greens. The Pebble Beach greens have a reputation for being small, tricky targets. In fact, there is not a green on the golf course larger than 4,000 square feet.

Three of the smallest greens, on holes 4, 5, and 7, are surrounded by bunkers, which created a definite traffic pattern over the years and contributed to a tremendous buildup of sand on the putting surface.

Through the use of a computer terrain modeling system, we were able to obtain a very accurate picture of why these greens were always in disrepair. The modeling program revealed that number four, a 2,420-square-foot green, had only 942 square feet of putting surface available for usable hole locations at the present day green speeds. The same situation was evident on two other greens as well. In addition to a small amount of usable area, all of these greens were constructed with native soil and had, over time, become very layered.

**G**REEN reconstruction to USGA Green Section Specifications commenced in March 1991. The fifth green, in addition to being very small and having definite soil profile problems, was also located in the coldest spot on the golf course. A large hill to the east obscures the sun during the winter months, and soil temperatures drop to 38°F through January. We enlisted the services of Biotherm Hydronics, which specializes in greenhouse bed heating systems in the nursery industry, to address this problem.

A sensor, located on the edge of the green, four inches below the surface, monitors soil temperatures. When soil temperatures drop below 55°F, a thermostat fires a boiler similar to a

swimming pool boiler. As water is heated to 140°F, it is pumped by a circulating pump through a grid system installed in the root zone mix, 11 inches below the surface.

With the U.S. Open now only 15 months away and all of the other greens consisting of 100 percent *Poa annua*, obtaining 18 holes with consistent putting surfaces was our next concern. It just so happened that one of the other Pebble Beach Company golf courses also had three *Poa annua* greens in need of rebuilding. A deal was struck with the superintendent, and by rebuilding three Del Monte greens, enough *Poa annua* sod was salvaged to sod three new greens at Pebble Beach.

The third and final phase of the restoration effort really put the finishing touches on the golf course. With the fairways maturing and 18 greens in playable condition, each project brought us closer to the end. Starting in May 1991, 11 green complexes needed complete or partial kikyugrass conversion. While these areas were being addressed, the bunkers were remodeled, the putting surfaces lost to kikyugrass encroachment were reclaimed, and the eight tees were leveled and enlarged.

By researching the company archives, we were able to put together a set of early 1900 photographs that proved instrumental in the bunker renovation effort and added a finishing touch to the restoration goals. More details need to be addressed before the Open, but we are confident our touch-ups will be shining when the cameras roll in June.