

The artistic as well as the practical come together on a public golf course on Cape Cod. Dennis Highlands offers the old world feel of St. Andrews with an innovative Integrated Planting System using low maintenance grasses, wildflowers and ornamental plants. Golfer and superintendent get the best of both worlds.

Yankee Ingenuity

73 percent of the golf course site receives either no maintenance or low levels of maintenance.

Blend a little Yankee ingenuity with the time-tested golf course design of the Scots, and the product is one of the most unique golf courses in the country—Dennis Highlands in Massachusetts.

In recent years the design trend in American golf courses has been toward "the Scottish look." This has commonly been associated with a naturalized blend of native plants, existing in harmony with the environment, and requiring minimum maintenance.

In Scotland, this effect is a product of the forces of natural selection of plants, often over hundreds of years. Although many attempts have been made to realize "the Scottish look" in America, most have not been totally successful because of incorrect selection of plant materials, or due to a climate too hot to grow the desired species.

In Scotland the predominate plant materials are fine fescues i.e., chewings, creeping red or hard and brown top (Colonial bentgrasses), gorse, heather, and beach grass.

In the northern U.S., golf course fairways and roughs have been traditionally planted to creeping bentgrass or a mixture predominately of Kentucky bluegrasses and perennial ryegrass, which require intense maintenance practices. Fine fescues, the predominate turfgrass found in Scotland, is often used in the U.S. but does not normally persist when subjected to moderate to high fertilization and irrigation, common in today's maintenance techniques.

In fact, it is this high fertilization and heavy use of irrigation that environmentalists find the most objec-

tionable about golf course development. This is particularly true in ecologically-sensitive areas as Cape Cod, Long Island, and the shores of the Middle Atlantic states.

And it is because of this intense respect for the environment that Dr. Michael Hurdzan in particular, is proud of Dennis Highlands.

"We had the utmost respect for the fragile environment of Cape Cod in planning this project," he said, "and I

Hole No. 3 shows contrast between sheep fescue (unmowed) and hard fescue in the rough. The fairway is bluegrass, the green is bentgrass.





Hole No. 3 shows wildflowers and sheep fescue behind and beside Par 3 green.

believe we achieved our goal of being as ecologically responsible as we could. Because of what we planted we reduced pesticide, fertilizer and water use as well."

Unique and practical

The Town of Dennis, Massachusetts, wanted a public golf course that would be unique in its appearance yet functional in its operation and maintenance. It had a 178-acre site, of glacial origin, that featured sharply rolling, sandy hills covered with pine and scrub oak.

In addition, the town wanted to keep developmental and operational cost low so that it could provide cit-

The Town of Dennis, MA, wanted a public golf course that would be unique in its appearance yet functional in its operation and maintenance.

izens and visitors with moderately low cost golf. As with any development there were deep concerns about the availability of ground water and its possible pollution with nitrogen fertilizers.

Realizing these issues, golf course architect Hurdzan, of Kidwell & Hurdzan, Columbus, OH, and Dr. Richard Hurley, vice president and turfgrass and plant material specialist, Lofts Seed, worked together to select plants that would persist under low maintenance and would achieve instantly on Cape Cod what it took centuries to achieve in Scotland. Their objective was to develop an Integrated Planting System (IPS) using commercially available grasses, wildflowers, and ornamental plants.



Wildflowers provide spectacular color as well as low-maintenance groundcover for Hole No. 16 at Dennis Highlands.

TABLE A

Golf Course Maintenance

Vegetative Type	Maintenance Required	Acres	% of Site	Degree of Maintenance
Completely Natural	None	15	8%*	None
Wildflowers	Mow once/year in November	28	16%*	Token
Roughs	Mow occasionally	87	49%*	Low
Fairways and Tees	Minimal water & Fertilizer applied as needed-Mow 2-3/wk	45	25%	Moderate
Greens	Water-fertilize-spray for weeds, insects & diseases-aerate-Mow 6 times/week	2.5	2%	High

* = 73% of the golf course site receives either no maintenance or low levels of maintenance.

TABLE B

Wildflower planting used at Dennis Highlands Golf Course, Cape Cod, Massachusetts

Variety	Color	Life Cycle
Baby's Breath	White	Annual
Scarlet Flax	Red	Annual
Bachelor Button	Mixed	Annual
Calendula	Orange	Annual
Purple Coneflower	Purple	Perennial
Evening Primrose	Yellow	Annual
Catchfly	Pink	Annual
Corn Poppy	Mixed	Annual
Blackeyed Susan	Gold	Annual
Coreopsis, lance leaf	Yellow	Perennial
Baby Snapdragon	Mixed	Annual
Lewis Flax	Blue	Perennial
Sheep Fescue	Gray/blue	Perennial

Equally important was respecting the fragile environment and ecological balance of Cape Cod.

To do this first required analyzing the soils, the microclimate, and expected climatic factors, then selecting plants compatible with the design intent.

Hurdzan, current president of the American Society of Golf Course Architects and a member of the USGA Green Section Advisory Board, and

his partner Jack Kidwell, wanted to design a golf course that didn't just acknowledge the Scottish look, but rather achieved it. It was at this point they contacted Hurley who holds a Ph.D. in plant breeding.

They decided the best way to achieve the desired results was to make plant selections as the golf course was designed, and not simply follow the traditional seeding specifications. They considered the golf

course as being composed of five distinct areas;

- 1 Completely natural
- 2 Cleared land but out of play
- 3 Roughs
- 4 Fairways and tees, and
- 5 Greens

The only areas they wanted to have intensive maintenance was the greens, moderate maintenance on fairways and tees, low maintenance in rough, and no maintenance in the

The out-of-play areas were seeded to 13 different wildflower species with a companion turf of sheep fescue.

other cleared areas such as behind tees and greens, buffers between holes, and the entrance areas.

One reason why some attempts at the Scottish look have failed is that although they look low maintenance, they often require high expenditures of men, materials and equipment.

"Very few golf courses are built to make a visual impact," Hurley says referring to Hurdzan's desire to use esthetically-pleasing as well as durable varieties of turfgrass. "Most (golf course) designers seem to use a cookbook formula for designing a course. Mike was very interested in developing the character of the course. I'm surprised more architects don't do this."

Keys to success

The key to success, thought the planners, was to specify plant materials that had slow growth rates, require little or no fertilization, and are very drought tolerant.

Since all three men were at one time golf course superintendents, they realized that the greatest expense for fairway maintenance was fertilizing and mowing, and for roughs it is mowing alone, often on a bi-weekly basis. Therefore it seemed the logical solution was to plant the fairways to aggressive bluegrass types that would heal quickly when injured by traffic or pests, and reduce the fairway areas as much as possible by planting low maintenance roughs.

From his experience and research,



Dr. Michael Hurdzan, designer of Dennis Highlands, grade stakes a bunker.

Hurley knew that although bentgrass provides the most prestigious and nicest playing conditions, it is also the most expensive to maintain and is usually reserved for country club-type courses. For public or municipal courses such as the Town of Dennis, a bluegrass-perennial ryegrass turf was needed to withstand the wear of 50,000 rounds of golf per year.

The added benefit is that bluegrass turf requires less spraying of costly chemicals to control turf diseases.

Then came the problem of which of the 50-plus bluegrass varieties on the market should be selected for use on the wind swept, sandy hills of Cape Cod.

They chose a blend of Mystic, Touchdown, BenSun (A-34) and Ram I, supplemented with a small percentage of Palmer and Prelude perennial ryegrasses and Jamestown chewing fescue. This blend was selected because of like texture and color of the bluegrasses to each other, their

independent resistance to turf pests, and their observed ability to establish and spread rapidly.

The roughs were seeded by the Delfino Corporation, the golf course contractor, in true Scottish fashion using Reliant hard fescue and Jamestown chewing fescue. The mixture was chosen because of its slower growth rate, resulting in less mowing, while persisting on almost no fertilizer or water.

Further this meant that only a single row irrigation system was needed for fairways which saved money during construction as well as during normal maintenance. The out-of-play areas were seeded to 13 different wildflower species with a companion turf of sheep fescue.

Low maintenance

Thus the basis of the program was to seed as much of the in-play area of the golf course to low maintenance fescues like those found in Scotland, seed fair-

ways to aggressive bluegrass to provide the more-manicured American playing conditions, and other cleared areas to wildflowers and sheep fescue that require no maintenance. (See breakdown of the site, (Table 1).

Since Dennis Highlands has just opened recently, Director of Golf Tom Flaherty could not give exact dollars saved by this concept. However, compared to Town of Dennis' other golf course, (which Flaherty also main-

The designers decided the best way to achieve the desired results was to make plant selections as the golf course was designed, and not simply follow the traditional seeding specifications.

tains) the mowing, fertilizing, and watering could be one-third less once Dennis Highlands matures.

Other monetary rewards were more evident.

"In the first four months of operation, 30,000 rounds were played and \$200,000 in greens fees were collected," reports Flaherty.

Not only was this Integrated Planting System functional from a maintenance standpoint, it also permitted the golf course architects to be more artistically expressive as well.

Palate of color

The fescue roughs were visually different from the fairways in terms of color and texture of the leaf blades, and the wildflowers grew to a height of three feet and produced a rainbow of color from early summer until after several killing frosts in the fall.

These visual differences permitted Kidwell & Hurdzan to make permanent design statements by contour planting as opposed to the less permanent contour mowing.

In addition, the mixing of textures, colors, and heights seem to generate a visual movement of the golf course features, that makes them seem dynamic and flowing and not just

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earthworks frozen onto a landscape. Further each vegetative type became part of the overall strategy of each hole, defining safe passages and exacting equitable but unusual punishment for improperly played shots.

Hurdzan, realizing the power of this rediscovered palate of colors, began to experiment with techniques once reserved for art done at a smaller scale such as the type done by painters, photographers, and landscape designers.

One example was on the fifth hole at Dennis Highlands where he designed a series of eight mounds in a complex as part of and to protect the green. The largest mounds were closest to the green and they degraded in size as they were built back toward the impact area for the drive. This technique is not new, but planting each set of two mounds to one of four different fescues with the lightest colors furthest from the observer, and the darkest ones closest, to emulate a "Smokey Mountain" image may be new.

To insure that the fescues would persist near the heavily watered green, part circle heads were installed. The intent is to distort distance and the effect is subtle, but it does show the potential for experimentation without being expensive or extreme.

But were Kidwell, Hurdzan, Hurley, Delfino and Flaherty content with their evolving statement of golf course architecture? Not quite.

Ornamental grasses

To supplement the already attractive appearance of the native and planted vegetation, they developed a planting plan for 22 species of ornamental grasses; possibly another first.

Generally, ornamental grasses grow vegetatively through the sum-

mer reaching a height of 18 inches for some species to 10 feet for others by September, then they produce beautiful seedheads or plumes which might reach an additional 18 inches to three feet high.

In the south one frequently sees Weeping Lovegrass and Pampas grass on golf courses, but these are not normally winter hardy in the northern latitudes. Since Hurley's hobby is raising northern ornamental grasses,

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he convinced the team to try them at Dennis Highlands.

At this writing, more than four hundred plants have been placed throughout the golf course to accent capes on bunkers, dress up tees, provide a mild hazard, and complement the existing natural vegetation. Most of the species used are expected to be compatible with the golf course operation and maintenance, forming another link in the Integrated Planting System of Dennis Highlands.

Because this is a first attempt by the men at applying this total system approach, they believe that the system may need fine tuning. But, the young turf is maturing well and the planting zones appear to be stabilized with each other.

Flaherty said some of the wildflowers didn't do as well as expected, but "we caused some of our own problems. The turf encroached too heavily on them," he said.

The need for water and fertilizer keeps the bluegrass confined to the fairway sprinkler pattern, the fescues love the droughty, minimal maintenance of the rough areas, and the wildflowers are, for the most part, thriving in place. However the real key to success of the system is the response of golfers. Will they like it?

For those who have had the good fortune to play golf in Scotland, they have learned to play golf shots off the softer bladed fine fescues used in the roughs, by taking one club longer than normal, swinging easy, and allowing for the ball to run once it lands. These shots are very predictable.

But since not everyone has developed this Scottish playing technique, and such a total immersion may not appeal to U.S. golfers, the fairways will provide the more normal American playing condition of the golf ball propped up by the stiff-bladed bluegrasses.

This two-turf system adds another subtle element that makes playing Dennis Highlands an even more exciting challenge than its middle distance of only 6,050 yards, par 71, would indicate.

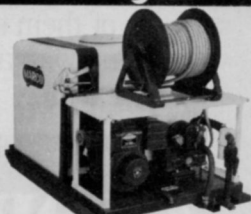
Throughout the design and construction process, the planners and builders wanted to provide a golf course that rewards excellent shot making without penalizing average golf play. They sought to match the penalty to the crime, and balance risk with reward for all skill level of golfers.

"The course is an absolute golfing pleasure," says Hurdzan. "It invites risk-taking; the rewards and punishments are commensurate to the risk taken."

The course is then set in a totally coordinated landscape that is esthetically pleasing no matter how well the golfer is playing.

It's hard to lose at Dennis Highlands. **WT&T**

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