

with Doak is difficult to define, he says.

"It doesn't necessarily mean we were not moving more earth than necessary, rather it's not moving more earth in more places than we need to. We want the course to look natural. I try to get a golf course laid out so all we have to do is shape the greens and tees."

The team completed nine holes during the winter of 2004 and seeded the last holes in September 2005. The course opened Sept. 7, 2006 even though people started playing golf in August.

FIRST GROW-IN

Dave Hensley, golf course superintendent at Ballyneal, first arrived on the project to help with construction as an assistant for superintendent Judd Fitzgerald, who quit two months into the project. An assistant superintendent at four or five clubs before coming to Ballyneal, Hensley wanted to work with Doak and become a superintendent.

"I like the idea of taking maintenance back to an easier day, working with what Mother Nature gives you," says Hensley, who managed his first grow-in at Ballyneal.

The fact that everything was done in-house attracted Hensley to the project.

"We put together about 60 guys," he says. "One guy installed every irrigation head, one guy did all the wiring, one team did the hydroseeding, and one team plucked out all the yucca. It was a big task to make sure the right crews were ahead of each other."

The maintenance staff consists of 20 people including Hensley, his assistant and the mechanic, during the season.

WORKING WITH FESCUE

Choosing fescue as the main turfgrass for the course was a big deal and an important decision because there's not much fescue grown in Colorado and Hensley had no prior experience working with it. The O'Neals and Hensley leaned on California-based consulting agronomist Dave Wilber, who had consulted on several of Doak's projects and grew up in Colorado.

"He's considered the guru of fescue," Rupert O'Neal says about Wilber.

To learn more about fescue, Hensley talked to superintendents who went through similar experiences as well as superintendents at Bandon Dunes.

AT A GLANCE Ballyneal Golf Club

Location: Holyoke, Colo.

Web site: www.ballyneal.com

Type of project: New construction

Owners: Rupert and Jim O'Neal

Architect: Tom Doak

Golf course superintendent: Dave Hensley

Project start: September 2004

Golf course opening: September 2006

Cost: Between \$2 million and \$2.5 million, including grow-in and some equipment cost, but excluding land and water

Turfgrass: Majority is fescue with some bentgrass and bluegrass

"I did all my learning at big-name private clubs, and I was used to keeping the grass green," he says. "You really don't understand the fescue surface until you touch it, smell it and play on it. The toughest thing for me was to let it go dormant. I didn't try to overmanage the fescue. They say let the fescue do its thing."

Hensley says it was difficult for him in the beginning to believe he could grow a mixture of fine fescues, bluegrass and colonial bentgrass in the wind, heat, dryness and chill of Northeast Colorado.

"The only thing I knew about it was that it made a fantastic golf surface in Europe and Oregon," he says. "It still puckers me up to think about the climate differences of Oregon and Europe versus that of Colorado. I remember a time during construction when it was 110 degrees outside and the surface heat of the sand was 150 plus, and the wind was blowing 20 miles per hour. I thought there was no way a putting green with fine fescues in the mix would survive in Colorado. Much to my disbelief, it's working, and when you see a surface that contains a fescue mix, you'll never forget how cool it is."

When seeded originally, the greens were 30 percent Colonial bentgrass, and the tees and fairways were 30 percent Colonial bentgrass and Kentucky bluegrass.

"We've stopped overseeding with bluegrass and bentgrass," Hensley says. "Right now, we're overseeding with 100 percent fescue."

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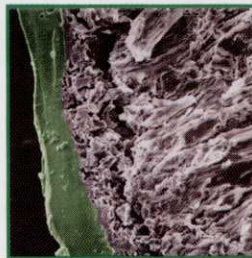
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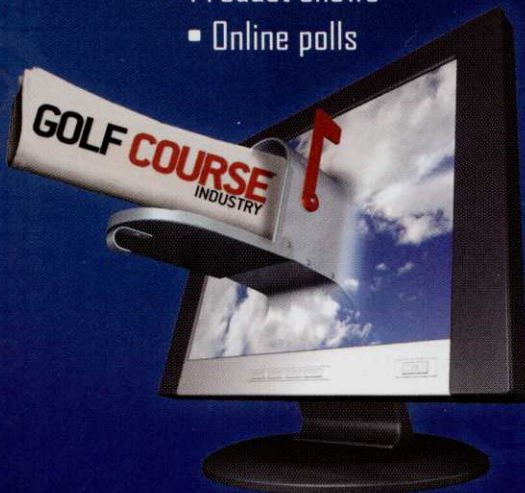
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Overseeding is for density and playing surface, which we want to play fast and hard. We're not concerned about color. Here, 'Get down with brown' is the motto."

However, it will take five years from the time of grow-in for the fescue to grow in to where Hensley and the O'Neals want the playing surface to be. Fescue requires less water and fertilizer to establish and maintain than other types of turfgrass, Hensley says.

"We grew in the golf course during one of the hottest summers in Colorado," he says. "The sand sucked everything dry. We didn't have snow that winter, and I kept the irrigation system charged up all winter so I could water a lot. It was a challenge figuring out how the young fescue was going to react to the temperatures and our style of management compared to the bluegrass and bentgrass. It took some experimenting and time to figure out that brown grass was good and brown grass turning to dust was almost good."

In trying to reach his goals, Hensley got ahead of himself in the beginning and started his "links land" watering and fertilizer program a little too early on some of the younger grass.

"I quickly learned it's a very fine line, and in finding that line, we learned that and what not to do," he says. "We found out which species and varieties are most viable in our environmental conditions (we're still finding out what varieties work) and found out what too little and too much fertilizer or water does to each of the species we used in our grassing specs. We can see areas on the course where we abused the fescue in the beginning and areas where we babied it. The areas we abused present the best playing surface. In the areas we gave too much attention to, we're now trying to reduce the percentage of bluegrass and bentgrass in the mix. You can not only see it, but you can feel it underneath your feet. You can feel the difference between a thick stand of fescue/bentgrass/bluegrass mix and stand of primarily bentgrass/bluegrass."

Hensley is still experimenting with different approaches and techniques every day.

"I'm continually told not to overdo things and wait for the fescue to do its thing," he says. "Approaching our third full year, I'm beginning to understand and see what they mean. At the end of the day, I've realized how important Mother Nature's decisions are to the success of our playing surface."

There are always naysayers about fescue,

Doak says.

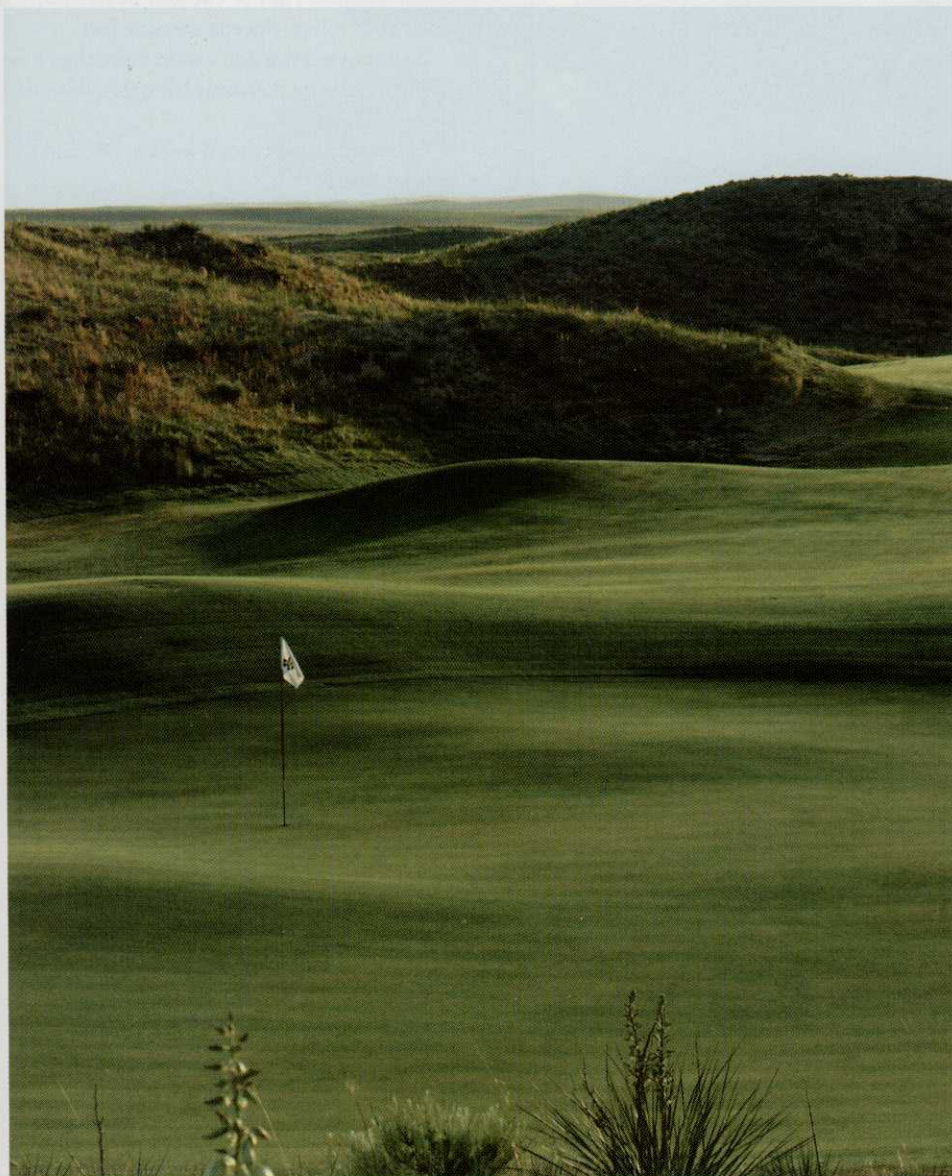
"They say, 'Five years from now, it won't be there,'" he says. "I know just enough about turf to be dangerous, but I know I'm a designer not an agronomist, so Dave Wilber was a big help. The problem with other cool-season grasses is that, in the windy and dry environment, you'd have to water more than fescue and the turf would become too thatchy. You would end up with a spongy surface that wouldn't play fast and firm."

It will take about five years for the fescue to reach the level of conditioning the team at Ballyneal wants. Photo: Dick Durrance

COURSE MAINTENANCE

When it comes to turfgrass management, different environmental climates call for different action. And at Ballyneal, Hensley jumps outside the box before he jumps into the chemical room.

"For the most part, our members and owners could care less about how the course looks, which is different thinking from the average golfer," he says. "Our members just want the



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course to play great. I'm definitely not the most experienced or smartest superintendent, but I feel a lot of guys cause their own problems by trying to overdo things, and it isn't necessarily their fault they're overdoing it. I blame the

mindset of the American golfer that 'green is good.' If golfers would ask, 'How did the course play' rather than 'How did the course look,' our jobs might be a lot easier."

So far, Hensley's pesticide inputs have been

minimal because of the environment and his attitude toward turf management, the cultural practices he implements and the game of golf.

Hensley is big on organic fertilizer. Nitrogen applications are less and less every year. The first year he used 4.5 pounds on the greens, and this year he's down to 2.5 pounds, but that's still higher than he wants, which is less than two pounds a year. Fairways will get two applications a year.

"We need that five-year period to see where we stand," he says.

The greens were mowed at .300 to start, then they went down to .250, and this past year were as low as .220. They're cut four or five times a week, plus rolled. Speeds are nine feet.

"Designwise, you don't want more than nine or 9.5 because it takes away from the contours," Hensley says.

Fairways are cut twice a week at .75, and tees are cut at .625.

The big thing with irrigation is not watering when it's not needed.

"We know with our management approach, it does us no good to sprinkle our grass and that fine fescues don't necessarily like wet feet," Hensley says. "When we water, we let it pour through. We found out that we can't baby this grass or else the playing surface becomes puffy and undesirable grasses thrive.

"We train our hand waterers to carry a small soil probe and water only dry areas, not brown grass," he adds. "My assistants and I constantly monitor and manage for irrigation uniformity. We look at the subsurface before the surface and this helps us make better decisions on when and what not to water."

UNDERSTANDING MEMBERSHIP

Though the course averages 30 to 40 rounds a day, the O'Neals aren't advertising for more members, but they're always looking for people who appreciate links golf. Last year, Ballyneal generated 4,000 rounds. The goal is 10,000 rounds, Hensley says. And the low number of rounds makes the maintenance crew's jobs easier.

"It's less expensive to keep and maintain your course with a true links golf course because you don't have to cover up imperfections," Hensley says. "From a superintendent's standpoint, it's one of the better jobs to have because you have an understanding owner and membership." GCI

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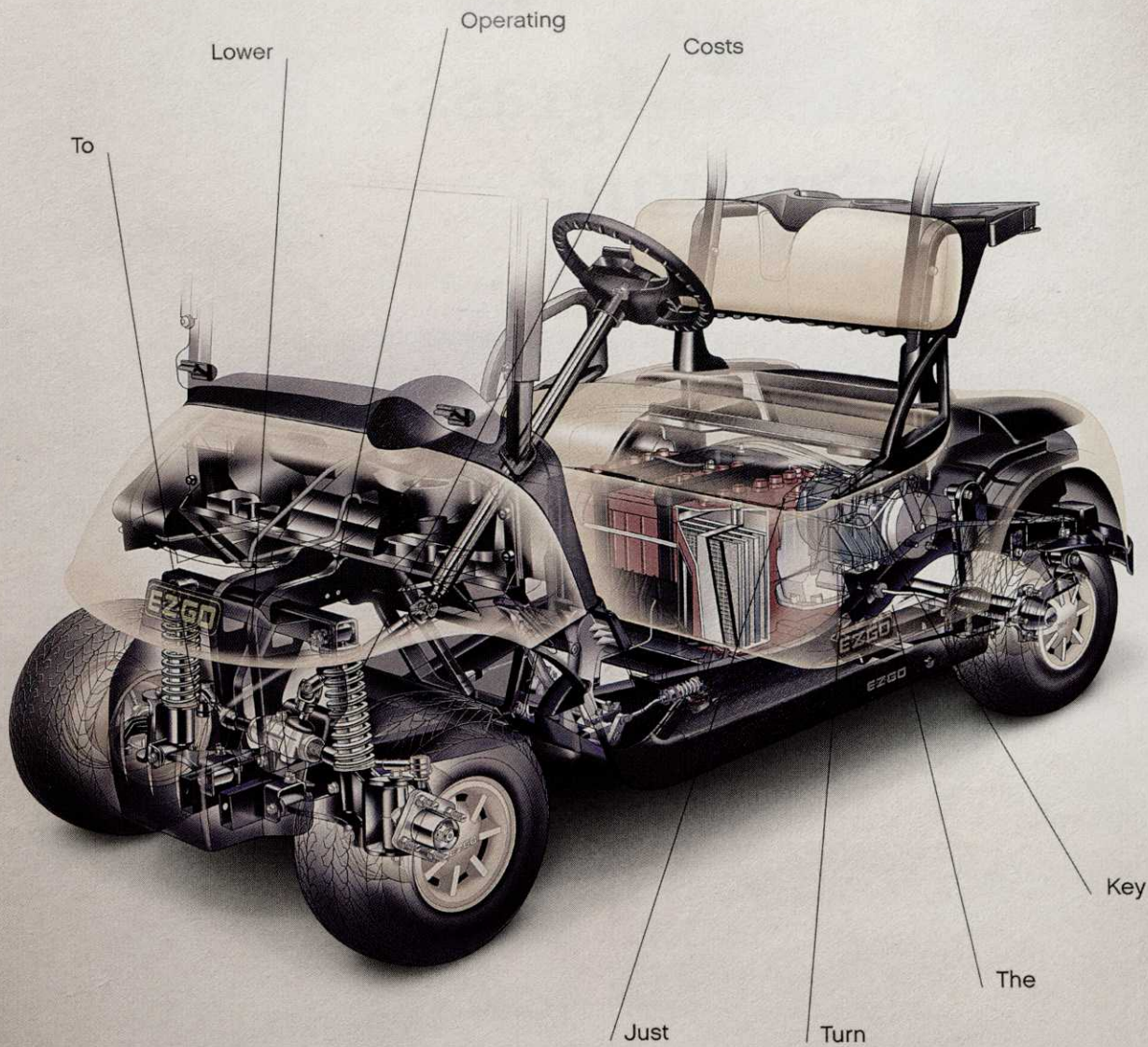
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EXCELLENCE IN MOTION



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BY WENDY GELERNTER, PH.D. AND LARRY J. STOWELL, PH.D.

Shade versus turfgrass: a no-win situation?

When asked what your top five pest problems are, do you consistently put trees at the top of the list – ahead of the usual suspects such as *Poa*, white grubs, brown patch or dollar spot? If so, you're not alone. Trees, or more specifically, the shade that trees create, pose a significant management problem for golf courses almost everywhere throughout the world. The unfortunate truth is that turf plants require lots of light for optimum

growth. Whether it's shade from trees, buildings or overcast weather, there hasn't been a turf variety developed that performs well when it's deprived of light.

THE IMPORTANCE OF LIGHT

Plants use light the same way animals use food – to fuel the chemical reactions that keep them alive. But different types of plants require different levels of light. Think of the

mosses and ground covers that grow on the forest floor or shade-loving house plants. These require little light for survival and would actually suffer and even die if exposed to harsh, direct sunlight.

In contrast, there are plants that require many hours of high intensity light per day, and will die if forced to grow in the shade. Plants that grow in desert environments, as well as agricultural crops such as corn and sugar cane,

FIGURE 1

What a difference 12 years makes. Aerial photographs of fairways taken in October 1986 (top photo) and 12 years later in October 1998 (bottom photo). Note the increase in tree height and shade on the fairways and associated greens. The increase of shade has resulted in patchy

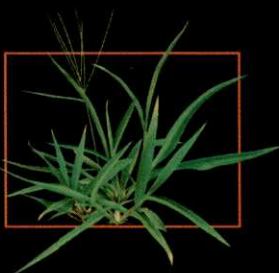
turf and weed invasion in the warm-season fairways and a decision to avoid fairway overseeding programs. Fairways that are aligned east to west are particularly harassed by tree-related shade problems, especially during the winter when the angle of the sun is lowest and shade patterns are maximized.



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Research

fall into this group. Most turfgrasses require significant quantities of light for optimum growth and development, but there are important differences among turf varieties.

IS THE SUN SHINING ON YOUR TURF?

Warm-season turfgrass varieties require two or more times the amount of light as cool-season varieties (Table 1). When reviewing the solar radiation data for locations throughout the U.S., the one interesting thing that stands out is that optimum sunlight for warm-season turfgrass is a rare commodity; only a few areas in the U.S. are really suitable. Even in areas where there is sufficient heat for warm-season turf, sunlight levels are too low because of frequent rainfall and cloud cover (as in the southeastern U.S.) or simply because of chronically overcast conditions (as in many coastal locations).

TABLE 1. Shade tolerance of key golf course turfgrasses

Turfgrasses with good to excellent shade tolerance generally produce good-quality turf, even when grown in partial shade. Unfortunately, there are no turfgrasses that grow well in full shade. Those with poor shade tolerance will produce poor-quality turf or won't survive at all under shaded conditions. These ratings are based on the assumption that all other factors (fertility, irrigation, air temperature) are being optimized for that particular turf type.

	GOOD TO EXCELLENT	FAIR TO GOOD	POOR TO FAIR	POOR
Cool season: optimum radiation = 116 - 233 watts/m ² /day or 240 - 480 langleys/day	<ul style="list-style-type: none"> • Fine fescues (creeping red, Chewings, hard, sheep) • <i>Poa trivialis</i> 	<ul style="list-style-type: none"> • Tall fescue • Velvet bent • Annual bluegrass 	<ul style="list-style-type: none"> • Colonial bent • Creeping bent 	<ul style="list-style-type: none"> • Annual rye • Kentucky blue • Perennial rye
Warm season: optimum radiation = 390 - 465 watts/m ² /day or 812 - 969 langleys/day		<ul style="list-style-type: none"> • St. Augustine • Zoysia • Kikuyu 	<ul style="list-style-type: none"> • Bahia • Buffalo • Carpet • Centipede • Seashore paspalum 	<ul style="list-style-type: none"> • Bermuda

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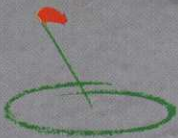
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Research

Despite the lack of sufficient solar radiation, many golf courses manage warm-season turf for at least part of the year because of its ability to withstand higher heat than cool-season turf. Nevertheless, the lack of sufficient light is an important stress that weakens warm-season turf, making it more susceptible to attack by pests, traffic and other stressors.

THE PROBLEM WITH SHADE

Light can be reduced by any number of factors. Interference from trees and buildings and cloudy weather are most common. These factors can cause a reduction in the number of hours of light a plant receives each day and/or the intensity of the light received. Whatever the cause, when turf plants receive less than optimal light, they begin to change almost immediately at the biochemical and molecular levels, resulting in lower rates of respiration and photosynthesis

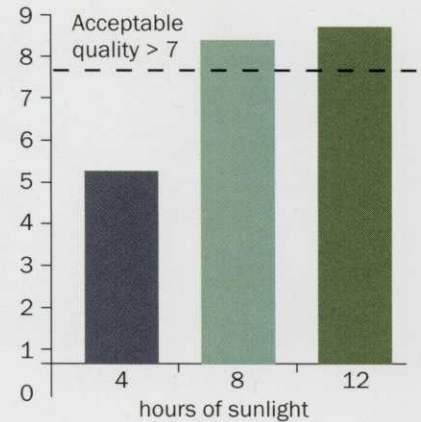
and slower plant growth. These more or less invisible changes soon bring about some obvious changes in the anatomy and appearance of turf including:

- Plants become elongated (taller), but stems are thinner and weaker. Internodes are longer, and stolons are fewer. Turf thins as a result.
- Root growth is decreased significantly. Shoot growth, shoot density and tillering are reduced, too.
- Leaves become darker, fewer in number, narrower and more succulent (more moisture is retained).
- The leaf's waxy protective outer layer, the cuticle, becomes thinner.

The resulting plants are weakened considerably, and turf quality is reduced significantly (Figure 2 and photo on page 78). The succulent leaves with their thinner cuticle are more susceptible to damage from traffic, equipment

FIGURE 2

Effect of duration of sunlight on TifEagle Bermudagrass greens. Acceptable quality turf was produced with eight hours or more per day of full sunlight. Turf quality suffered dramatically when sunlight hours were reduced by shade to four per day. Data from Bunnell and McCarty, 2004. Similar trends are observed for cool-season turf.



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