



By Victor A. Gibeault and Stephen T. Cockerham

**T**urfgrasses for sports facilities have to fill a tall order. They must be durable grasses capable of withstanding intensive use, often-times under restricted budget and cultural programs, while simultaneously providing a smooth, uniform surface that is conducive to good play and safety. They must also look good because of the aesthetic function they provide for spectators on-site or a television viewing audience.

Viewed from a national perspective, both cool-season and warm-season grasses are used for sports turf facilities with the choice of grass being dependent on local climate and soil, facility use, and budget and personnel support. Zoysiagrasses, which are warm-season turfgrasses, have not been widely used in the past in the warm regions of the country because of the limited availability of good performing cultivars for high-play locations. Nevertheless, zoysiagrasses are tolerant of heat, drought, salinity, shade and are not commonly susceptible to disease, insect or weed invasion problems. Also, they have high-traffic tolerance, an advantage that is somewhat offset by the grass's slow recuperative ability if the sward is severely damaged from too much play.

### Breeding Initiated

Because of the many positive characteristics of zoysiagrass, a long-term plant breeding program at the University of California, Riverside (UCR) focused on the development of improved experimental zoysiagrass lines and, ultimately, cultivars for warm-season turfgrass climate zones. The breeding objectives were to develop grasses having good color, texture, density, uniformity and pest resistance while providing an acceptable establishment rate (zoysiagrasses can be very slow to establish). Of particular interest to southern California and similar climates was for the new grasses to have extended green color retention into, or throughout, the winter season when most warm-season turf-

# De Anza Zoysia: A New Turfgrass for Sports



Zoysia test plots at UCR.

grasses go dormant. Following an extensive breeding and selection program that involved the long-term evaluation of several hundred plant types, De Anza zoysiagrass and a sister grass, Victoria, were recently patented and released from the University of California for commercial development.

De Anza zoysiagrass was produced by hybridizing two distinct zoysiagrass selections: El Toro zoysiagrass was the female parent, and an experimental grass coded UCR #3 was the male parent. Consistently, the winter color retention of De Anza was the best for any of the grasses examined with the cultivar retaining good color characteristics throughout the winter in Riverside (inland) and Irvine (coastal) areas of southern California.

De Anza has a medium leaf texture (with El Toro being coarse textured and Emerald being fine textured); the leaf color is light green. The leaf blade is upright and stiff and withstands wear very well. Like all zoysiagrasses, De Anza spreads by tillers, stolons and rhizomes, again an advantageous growth habit for heavily used turfed sites. There is no seed production of the cultivar, so when used on a turfed site, it will be vegetatively propagated from sod or sprigs.

### Mowing Studied

Two questions raised with this new grass were the mowing height tolerances and the vertical mowing requirements for varying play and use conditions. Several issues were involved: the spongy sensation of walking or

running on traditional, mature zoysia-grasses with deep thatch is objectionable and results in poor footing for sports facilities; also, zoysiagrass at lower mowing heights greens up earlier in spring, recovers quickly from thatch removal, and is of good quality in the summer months. Previous research has shown that maintaining zoysiagrass at a low mowing height and mechanically removing thatch reduced sponginess and improved footing.

For these reasons, a two-year study was conducted at the University of California, Riverside to evaluate De Anza performance under five mowing heights: 3/8 inch, 1/2 inch, 3/4 inch, 1 1/4 inch, and unmowed. Also, three vertical mowing treatments were evaluated: 0, 1, and multiple times per year. It was found at the Riverside location that De Anza gave a similar, good visual appearance at the four mowing heights and that aesthetic appearance was somewhat negatively affected for one to three weeks following vertical mowing.

Clipping yields that were collected showed that most growth occurred with the 3/8-inch, 1/2-inch, and 3/4-inch mowing height treatments, indicating those heights to be very acceptable for optimum growth and development of De Anza zoysiagrass. Thatch thickness increased with increasing mowing heights, as would be expected. Multiple vertical mowing treatments reduced measured thatch by 11% in this study. The multiple treatment also was shown to reduce sponginess between 16% and 34% (summer and



For two years, UCR studied De Anza at five mowing heights, which included an unmown control.

autumn, respectively) as measured by a Clegg Impact Tester.

Regarding mowing in summary, De Anza responded favorably to various cutting heights but definitely benefited from vertical mowing.

### Winter Appeal

Other studies with De Anza have shown it to be a warm-season turfgrass capable of avoiding or postponing winter dormancy in southern California's climate. Chilling temperatures, causing injury or stress, interacting with high light intensity result in loss of chlorophyll and dormancy for most warm-season grasses, until warmer temperatures return in late-winter or early spring when re-greening occurs. Normally, the winter temperatures in southern California are very close to threshold temperatures that cause chlorophyll degradation.

The breeding program that developed De Anza specifically selected for grasses that had superior winter color-retention characteristics when compared to all commercially available and most experimental zoysiagrasses. Also, it has been shown that De Anza responded very strongly to nitrogen fertilization by consistently giving high winter color ratings; iron moderately, but significantly, positively influenced the grass winter color.

Zoysiagrasses can be overseeded for winter color if necessary. De Anza, when overseeded with perennial ryegrass or tall fescue in October, had the cool-season grasses germinating and covering quickly, with the perennial ryegrass and tall fescue mixing well with the zoysiagrass and enhancing winter color marginally under southern California conditions, where the winter temperatures and chilling influence are moderate. The mix of tall fescue and De Anza zoysiagrass was

particularly appealing. Even so, turfgrass quality was compromised during the warmer spring and summer months following overseeding because of the survival and competition from tall fescue and perennial ryegrass under southern California conditions.

### Traffic and Shade

Like all zoysiagrasses, De Anza tol-

erates traffic well but is slow to recover from severe damage caused by too much wear. Under partial shade conditions, De Anza has proven able to provide both shade and traffic tolerance better than other commonly used cool- and warm-season turfgrasses.

For these reasons, De Anza is planned for use in the Bank One Ballpark in Phoenix, a stadium currently under construction to house the


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Arizona Diamondbacks baseball franchise. The facility will have a retractable roof to provide an open air stadium in spring and fall. During home stands in the hot Arizona summer, air conditioning will be required for spectator comfort and the roof will be closed. The commitment was made to have natural grass as the playing surface.

Questions asked regarding the use and selection of natural grass in this unique sports environment included the following:

How much light is required for turfgrass used for sports?

Can the light be supplemented?

Is there a low-light turfgrass suitable for a sports field?

Will the grass make an adequate



**De Anza has been planted on the Arizona State University baseball diamond to test the playability of the new zoysiagrass.**

baseball infield?

Can the roof be closed for home stands?

If air movement is required for grass growth, how much?

How can recovery from injury be enhanced?

How long will it take the sod to root in the spring?

Initial experimentation and literature reviewed indicated that zoysiagrass would have the best chance of providing the needs of the facility because of its adaptability to low light while having good traffic tolerance. It was determined that De Anza had the rapid rate of growth to provide quick establishment and recovery from injury as well as an acceptable tolerance to the anticipated low light conditions of the stadium. Bank One Ballpark is scheduled for De Anza zoysiagrass to be established in the winter season, 1998.

In summary, De Anza zoysiagrass is a new cultivar that will have a role to play in sports fields where warm-season grasses are adapted. It has good color, texture, density, uniformity, shade adaptability, traffic tolerance, and can be maintained at varying mowing heights dependent on the requirements of the facility. Where winter temperatures are moderate, it has superior color retention, especially when fertilized with soluble nitrogen and iron. In locations with more severe winter temperature conditions, overseeding with commonly used cool-season grasses can be performed with a successful mix of the cool- and warm-season grasses.

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