

## Improving Creeping Bentgrass Performance Under Shade: Cultivar Selection and Cultural Practices

by Christian Baldwin, Ph.D.

Managing turfgrasses under shade is tricky for golf course superintendents. It's no surprise really: golf courses consist of two plant types, turfgrass and trees, both expected to perform optimally while competing for similar resources of water, sunlight, and nutrients. In this artificial ecosystem, turfgrass growth and development are often inhibited. Shade causes many negative anatomical, physiological, and morphological effects on just about all turfgrass species (see table, page 2). However, trees are an integral part of the golf course landscape.

### Varieties in shade

While cultural practices are important to improve any turfgrass species performance under shade, cultivar selection is a critical component. Shade tolerance of cool-season species has been well documented, but there is limited information regarding the shade-tolerance of creeping bentgrass cultivars.

Turf managers have discovered through practical application that 'Alpha' creeping bent displays remarkable tolerance to both building and tree shade environments. At the Capuchos Golf Club in Portugal, the practice green was situated in a precarious position between two clubhouse buildings. As a result, the green receives only 2 hours of full sunlight per day. The superintendent was astounded by the shade performance of Alpha under very challenging conditions.

At Lansing Country Club in Michigan, managers sculpted a pro-tee out of a thicket of oak. Despite sparse sunlight, the Alpha tee has successfully kept Poa at bay.

Researchers at Oklahoma State Univ. examined the difference between 'L-93' and 'SR1020' creeping *Cont, p. 2*



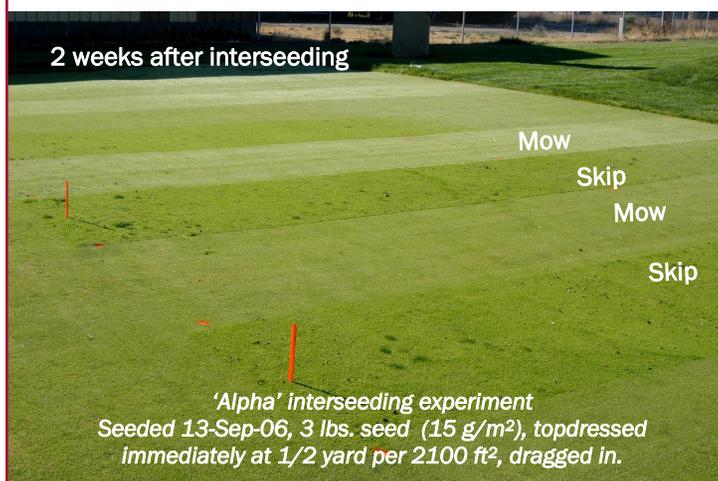
'Alpha' bentgrass tolerating building shade at Capuchos Golf Club in Portugal

## "To Mow or Not to Mow...?" Research Fine-Tunes Mowing During Interseeding

by Doug Brede, Ph.D.

I was speaking to a superintendent's group in Denver three years ago on the subject of interseeding bentgrass into *Poa annua*, when a young superintendent raised his hand and asked a question that left me without a response:

"Do I do anything special after interseeding in terms of mowing?" he inquired.



2 weeks after interseeding

Mow

Skip

Mow

Skip

'Alpha' interseeding experiment  
Seeded 13-Sep-06, 3 lbs. seed (15 g/m<sup>2</sup>), topdressed immediately at 1/2 yard per 2100 ft<sup>2</sup>, dragged in.

The question seemed simple enough, but the underlying concepts were enormously complicated. I bided for time as my mind raced through conflicting theories of plant competition in an effort to give him some guidance:

- Perhaps if you skip mowing for a few days while the seedlings are emerging, the mower would do less damage to them. ...OR...
- Perhaps by skipping mowing, you'd let the Poa get too tall, and it would shade out the germinating bents.

After puzzling over the question for what *Continued, p. 2*

*Continuously mowing throughout the establishment of newly interseeded bentgrass produced slightly but consistently more bent coverage than skipping a week or more of mowing. Skipping week 2 was the hardest on the bent. That's likely the week the seedlings were germinating and additional shading was detrimental.*

Mowing treatment	6-Sep-07	8-Oct-07	8-Jul-08	10-Sep-08
	—— % bent ——			
Continuous mowing	23	32	51	62
Skip week 1	23	29	43	56
Skip week 2	18	24	48	54
Skip week 3	23	34	48	56
Skip weeks 1,2,3	21	30	42	57

Shade, continued



bentgrass under shade and restricted airflow stress. The researchers concluded that **L-93** had significantly better color (8.0 vs. 6.7), greater density (8.1 vs. 7.6), and less disease (0.3 vs.

1.6) than SR1020 over the two-year study period. Regarding the type of stress, air flow restriction was more detrimental to both creeping bentgrass cultivars than shade stress. This study suggests that **L-93** is more suitable in a reduced light environment than SR1020.

Regardless of turfgrass species, studies have noted altering cultural practices can significantly improve the performance of turfgrasses under shade. These include raising mowing height, reducing nitrogen rate, applying plant growth regulators, minimizing foot/vehicle traffic, thinning trees, and watering deeply and infrequently. 🌱

**Table 1. Responses of turfgrasses grown under shade (adapted from Fry and Huang [2004]).**

<b>Anatomical</b>	Thinner stems
Thinner cuticle layer	More upright growth
Lower stomatal density	<b>Physiological</b>
Fewer chloroplasts	Higher chlorophyll content
<b>Morphological</b>	Lower respiration rate
Thinner, narrower leaves	Lower photosynthetic rate
Longer leaves and internodes	Lower transpiration rate
Lower shoot density	Greater succulence
Fewer tillers	Lower carbohydrate reserves

**Seed Harvest Update**

In 2008, pricing of fertilizer, chemicals, and diesel jumped through the roof for grass seed farmers. The increases caused growers to demand higher contract prices for their seed.....and they got them due to high farm-gate pricing of competing commodities like wheat and corn.

“With the condition of the economy and housing starts at all time lows, there has been a strong push from dealers and growers to reduce acreage of all cool-season turf species,” says Glenn Jacklin, Jacklin Seed’s production manager.

Coming off 2008, where acreages of all turf species (with the exception of tall fescue) had already been reduced to 10-year lows, this is just another indicator of how poor the economy is. Overall crop conditions of the cool-season species are good coming out of winter. The 2009 crop is expected to be of very good quality, as most fields that were left in were the well established, good quality fields. Any fields that were marginal in quality (i.e., weeds, off-types) most likely met “Mr. Plow.” 🌱

Mowing after interseeding, continued

seemed like minutes, I told him I didn’t really know what mowing practices would be best. But, by golly, I’d find out.

I returned to the office the next day and searched the scientific literature for an answer, but came up empty handed. So I decided to plant a test trial on our *Poa annua* green here in Idaho. By this time Labor Day was approaching, so I realized the timing was not optimal to favor bent. But rather than wait 9 months for optimal timing, I decided to interseed in early September – a worst-case scenario for interseeding bent. That’s the time when *Poa* is at its fittest.

Fall planting posed another question: After interseeding, what fungicide should you use for snow mold control? PCNB fungicide is notoriously rough on bent. Would its use cut down on bent establishment? I wanted to find out.

Unexpected results

Admittedly, fall is not the best time for interseeding into established *Poa annua*. But this study shows it can be done – if you’re patient. Establishment and ground fill in fall is much slower than from a May or June planting.

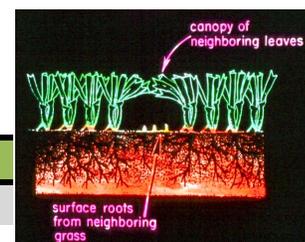
The table on the previous page illustrates the progression of **Alpha**’s coverage as affected by mow treatments. By the end of one year there were few differences in coverage. A trend emerged in the second year indicating less fill in the “skip week 2” treatment. That’s the week when bent seedlings would normally emerge. Skipping week 2 would allow the *Poa* to grow taller and shade the seedlings. It was becoming clear that the continuous mowing treatment produced the most bent. Light shading seems to have trumped any mower injury.

Fungicide treatments were striped across the mow treatments in a checkerboard fashion two months after interseeding. The high rate of PCNB had a slight detrimental effect on bent populations in second year numbers. Presumably this was due to phytotoxicity. Banner Maxx plots also had less bent but for a different reason. Banner Maxx was sprayed in fall and again in spring to control snow mold. Doing this also protected the *Poa* from an anthracnose outbreak the following year, resulting in healthier *Poa* and lower bent density.

In conclusion, if I knew then what I know now, my answer to that Denver superintendent would be this: Mow normally throughout establishment. Don’t skip a week. And try to inflict a little stress (anthracnose, drought, etc.) on the *Poa* to help discourage it. 🌱

**Fungicides applied for snow mold affected bent populations. Banner Maxx and the high rate of PCNB slightly reduced bent populations – both for different reasons (see text). Poa health was rated on a 1 to 9 scale, with 9=healthy Poa.**

Fungicide treatment	% bent	% bent	Poa health
	6-Sep-07	8-Jul-08	8-Oct-07
Banner Max 4 fl. twice	18	37	5.6
Check	21	50	3.8
Glacier 4F PCNB 12 fl.	23	44	3.7
Instrada 5 fl. oz.	22	50	3.6
Glacier 4F PCNB 6 fl.	24	51	3.6



**Interseeded seedlings face two impediments to survival: Shading from leaves and surface root growth from nearby plants.**