

**Table 4**  
**Spring green up and genetic color means**  
**for 26 bentgrasses in 2003 NTEP**  
**putting green height bentgrass trial**  
**2004 – 2007.**

ENTRY NO.	CULTIVAR	SPRING GREEN UP	GENETIC COLOR
1	LS-44	5.3 e-h	6.5 ij
2	Penn A-1	5.2 d-h	6.3 h-j
3	Benchmark DSR	5.1 c-h	6.2 h-j
4	Penncross	4.5 ab	5.7 d-g
5	CY-2	4.1 a	6.0 g-i
6	Alpha	5.4 h	7.3 k
7	T-1	5.4 gh	6.6 j
8	SR 7200	4.7 b-d	5.2 a-c
9	13-M	5.3 f-h	5.9 f-h
10	Declaration	5.1 c-h	6.1 g-i
11	Independence	4.9 b-g	5.4 b-e
12	Legendary	4.5 ab	4.9 ab
13	Authority	5.2 e-h	6.1 g-i
14	Bengal	5.4 gh	6.3 h-j
15	Kingpin	5.2 d-h	5.7 d-g
16	Villa	4.8 b-e	5.2 a-c
17	IS-AP 9	4.6 a-c	5.9 f-h
18	Venus	4.4 ab	4.8 a
19	Vesper	4.9 b-g	5.5 c-f
20	Memorial	5.3 gh	6.2 g-j
21	7	4.9 b-h	5.3 b-d
22	Greenwich	4.6 a-c	5.1 a-c
23	Shark	4.8 b-f	5.9 e-h
24	MacKenzie	4.9 b-g	5.9 f-h
25	Tyee	5.2 d-h	6.2 h-j
26	Pennlinks II	5.3 f-h	6.0 f-h
<b>LSD 0.05</b>	<b>0.5</b>	<b>0.5</b>	

**Table 5.**  
**Entries and sponsors in 2003 NTEP fairway trial**

ENTRY NO.	CULTIVAR	SPECIES	SPONSOR
*1	LS-44	creeping	Links Seed, LLC
*2	L-93	creeping	Standard Entry
*3	Bardot	colonial	Standard Entry
*4	Penncross	creeping	Standard Entry
5	EWTR	colonial	Landmark Seed Co.
*6	Alpha	creeping	Jacklin Seed by Simplot
*7	T-1	creeping	Jacklin Seed by Simplot
*8	Princeville	creeping	LESCO, Inc.
9	13-M	creeping	Pennington Seed
*10	Declaration	creeping	Lebanon Turf Products
*11	Independence	creeping	Lebanon Turf Products
*12	Tiger II	colonial	Standard Entry
*13	Authority	creeping	LESCO, Inc.
*14	Bengal	creeping	Barenbrug USA
*15	Kingpin	creeping	ProSeeds Marketing
*16	Greentime	colonial	DLF International Seeds
*17	Runner	creeping	DLF International Seeds
*18	Shark	creeping	Mountain View Seeds, Ltd.
*19	SR 7150	colonial	Seed Research of Oregon
*20	MacKenzie	creeping	Seed Research of Oregon/Pickseed
*21	SR 1119	creeping	Seed Research of Oregon
*22	SR 1150	creeping	Seed Research of Oregon
*23	Pennlinks II	creeping	Tee-2-Green Corp.
*24	Penneagle II	creeping	Tee-2-Green Corp.
*25	Crystal BlueLinks	creeping	Tee-2-Green Corp.
26	PST-9NBC	colonial	Pure-Seed Testing, Inc.
27	PST-9VN	colonial	Pure-Seed Testing, Inc.
*28	Seaside	creeping	Standard Entry

\*Commercially available in the U.S. in 2008.



When examining monthly quality performance based on the number of times a cultivar performs above the mean, the top group shrinks. In at least 26 monthly evaluations, only 13-M, Crystal BlueLinks, Declaration, Penneagle II, and T-1 performed above the mean (Table 7). Again, none of these grasses are colonial bentgrasses.

*Spring Green Up and Genetic Color* – Spring green up was similar throughout the 4 years of evaluation and there were no statistically significant differences among cultivars (Table 8). There were significant differences however, among genetic color ratings. Two creepers, T-1 and Kingpin, were darker green than the other cultivars in the trial. In fact, T-1 is a unique dark blue-green that stands out and will create an interesting contrast to other turfgrasses on your course. Also, the colonial bentgrasses tended to be more olive-green than the blue-green creepers.

## Recommendations and Future Activities

I often find it difficult to recommend cultivars for putting surfaces given the differences in management expertise, budgets, number of rounds per year, rootzones, and microclimates. In most cases, if you know that you're going to re-grass greens in the future, I would select several of the top performers in this trial and grow them for a couple of years on a practice green to

evaluate performance under your specific environmental and management conditions. That stated, the two grasses that really performed well over the last two-and-a-half years of the putting green test were MacKenzie and Tyee. These two varieties stood out as probably the best putting green grasses we've grown over the past 20 years at our Urbana site. Unfortunately, I'm not aware of courses where either of these grasses has been tested under "real-world" conditions, so proceed cautiously if you're considering planting these types.

For fairways, the grasses 13-M, Crystal BlueLinks, Declaration, Penneagle II, and T-1 all performed well. Again, without some real world applications to evaluate, I would proceed slowly by trying to test grasses at your sites before undertaking a major re-grassing. On a side note, I have seen

T-1 planted in the tee boxes at Red Tail Run, a newer course in Decatur. The turf managers at the site are pleased with its performance due to its color, density, and re-growth.

In September, we'll be planting a new fairway trial in Urbana and a putting green trial in Glenview, at North Shore Country Club. If trends continue, these next trials will bring us some more outstanding grasses capable of providing the conditions demanded at the highest levels of golf. **-OC**

**Table 6**  
**Quality performance**  
**of 28 bentgrasses in 2003**  
**NTEP fairway trial**  
**2004 – 2007**

ENTRY NO.	CULTIVAR	MEAN QUALITY
1	LS-44	6.3 h-j
2	L-93	5.9 f-i
3	Bardot	4.1 a-c
4	Penncross	5.5 fg
5	EWTR	4.6 cd
6	Alpha	6.4 h-j
7	T-1	6.5 ij
8	Princeville	5.9 f-h
9	13-M	6.3 h-j
10	Declaration	6.5 j
11	Independence	5.8 f-h
12	Tiger II	4.7 cd
13	Authority	6.2 h-j
14	Bengal	5.9 f-j
15	Kingpin	6.0 g-j
16	Greentime	4.8 de
17	Runner	6.3 h-j
18	Shark	6.2 h-j
19	SR 7150	4.1 a-c
20	MacKenzie	5.8 f-h
21	SR 1119	5.8 f-h
22	SR 1150	6.0 g-j
23	Pennlinks II	5.3 ef
24	Penneagle II	6.3 h-j
25	Crystal BlueLinks	6.4 h-j
26	PST-9NBC	4.4 b
27	PST-9VN	3.8 ab
28	Seaside	3.6 a
LSD 0.05	0.6	

**Table 7**  
**Turf quality performance above the mean**  
**for 28 bentgrasses in 2003 NTEP fairway trial**  
**2004 – 2007**

ENTRY NO.	CULTIVAR	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	TOTAL
25	Crystal BlueLinks	4	4	4	4	4	4	4	28
7	T-1	4	3	4	4	4	3	4	26
9	13-M	3	4	4	4	3	4	4	26
10	Declaration	4	4	4	3	3	4	4	26
24	Penneagle II	4	3	4	4	3	4	4	26
1	LS-44	4	3	4	4	4	3	3	25
6	Alpha	4	3	4	4	2	4	4	25
17	Runner	3	4	4	4	2	4	4	25
13	Authority	3	3	3	4	4	3	4	24
14	Bengal	3	2	4	4	3	4	3	23
22	SR 1150	3	4	4	3	2	4	3	23
2	L-93	4	2	3	3	2	4	4	22
11	Independence	3	2	4	4	3	3	3	22
18	Shark	3	4	4	3	4	2	2	22
15	Kingpin	2	3	4	2	3	3	4	21
21	SR 1119	2	1	3	3	3	4	4	20
8	Princeville	2	2	2	3	3	3	3	18
20	MacKenzie	2	1	3	2	4	2	4	18
23	Pennlinks II	1	1	1	2	3	2	4	14
4	Penncross	2	2	1	2	1	3	1	12
16	Greentime	1	1	0	0	1	1	1	5
12	Tiger II	1	1	0	0	1	0	1	4
26	PST-9NBC	1	1	0	0	1	0	1	4
5	EWTR	1	0	0	0	1	0	0	2
3	Bardot	0	0	0	0	0	0	1	1
27	PST-9VN	0	0	0	0	0	0	1	1
19	SR 7150	0	0	0	0	0	0	0	0
28	Seaside	0	0	0	0	0	0	0	0

**Table 8**

**Spring green up and genetic color means for 28 bentgrasses in 2003 NTEP fairway height bentgrass trial 2004 – 2007**

ENTRY NO.	CULTIVAR	SPRING GREEN UP	GENETIC COLOR
1	LS-44	5.4	6.4 h-k
2	L-93	5.3	6.7 f-j
3	Bardot	5.3	4.6 ab
4	Penncross	5.0	5.5 c-f
5	EWTR	5.7	4.6 ab
6	Alpha	5.3	6.6 i-k
7	T-1	5.5	7.8 l
8	Princeville	5.2	5.7 b-d
9	13-M	5.8	6.3 g-j
10	Declaration	5.2	6.0 e-i
11	Independence	5.4	6.0 e-i
12	Tiger II	5.4	4.8 a-c
13	Authority	4.8	6.1 f-j
14	Bengal	5.3	6.3 g-j
15	Kingpin	5.4	7.1 kl
16	Greentime	5.7	5.6 d-g
17	Runner	6.0	5.3 c-e
18	Shark	5.6	6.0 e-i
19	SR 7150	5.5	5.8 d-h
20	MacKenzie	5.3	6.3 h-j
21	SR 1119	5.3	6.8 jk
22	SR 1150	5.4	5.5 c-f
23	Pennlinks II	5.0	6.3 g-j
24	Penneagle II	5.8	6.3 g-j
25	Crystal BlueLinks	5.5	6.7 f-j
26	PST-9NBC	4.9	5.3 c-e
27	PST-9VN	4.0	5.9 e-i
28	Seaside	4.8	4.4 a
LSD 0.05	NS	0.8	



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## FEATURE ARTICLE II

Tom Shapland, Wadsworth Construction Company

# The Drainage Dilemma



*Construction, renovation, or ongoing maintenance of a golf course is often thought of in a romanticized way – an art form with a minor element of underground engineering required to keep the “artwork” in its most beautiful condition. Professionals in the industry know differently. A functioning golf course is primarily an evolving engineering project with an element of art thrown in for good measure. The core of this engineering project is its drainage system.*

The elements of a well-drained golf course go far beyond pipes and structures. The development of a good drainage system starts with a thorough understanding of the basic characteristics of the soil. The soil's abilities to percolate, shed, and retain moisture are all factors in determining the requirements of the drainage system. The quality of the irrigation water is also a consideration in the design of the drainage system. Before embarking on any major drainage additions, it is always a good idea to work closely with a qualified soils laboratory to determine the special conditions that may exist on the golf course.

The second consideration in developing a practical drainage system is developing an understanding of the natural drainage patterns of the site. It is important:

- 1) to determine where water leaves the site,
- 2) to determine the size of the offsite drainage basin that flows runoff through the site, and
- 3) to determine the amount of water the existing outfalls can handle without causing floodwaters to back up into the course.

All the golf course drainage in the world cannot overcome a debris-strewn, plugged up outfall. Before investing in interior drainage systems, it is prudent to review the site with a competent engineering firm to make certain that additions to the system will function as intended and provide value to the golf course.

The next element in designing or improving the golf course drainage system may seem obvious — determining where drainage can be effectively installed. But going to the worst wet

spot on the course, installing a perforated drain or catch basin, and running a pipe to the nearest low area or pipe is often not successful in solving the problem. The existing slope and initial grading of the course are important factors in determining what and where supplemental drainage can be most effectively installed. A rule of thumb in the Midwest is that, to avoid wet

conditions, a minimum three percent slope should exist in playing areas, and water should not be carried on the surface for more than 150 feet before it is run into a catch basin. When water is run further on the surface, it tends to accumulate in the low areas regardless of the drainage installed. There is a good chance that diverting water into swales or grading catchments and installing basins far above the “worst wet spot” may be far more effective than attacking the problem locally.

### **A couple of other pertinent rules of thumb:**

To take reasonable advantage of the pipe that is installed, the diameters of the catch basin grates and risers should be at least three times the size of the pipe installed.

When trying to dry up a wet swale, install the trunk line (perforated or solid) parallel to the swale and out of the lowest area with perforated spur lines crossing the swale at regular intervals. In this manner, water has to cross the grveled lines as it moves downstream and is more likely to be collected in the pipe. And, in a major storm, the drainage system is far less susceptible to being washed out.

*(continued on page 16)*



Relatively flat installations (< than 1% slope) require larger diameter pipe than might normally be thought necessary to effectively carry water, as small diameter pipe in low velocity situations is prone to being plugged with sediment.

A variety of products are specified to solve different drainage issues. For large diameter pipe installations, reinforced concrete pipe (RCP) is often specified, as it is the strongest and most durable product on the market. Less often, corrugated metal pipe (CMP) is specified and installed. While less expensive than concrete, it is not as strong and is subject to corrosion. Triple-walled, high-density polyethylene (HDPE) pipe is used primarily on golf courses for several reasons. It is durable; it is easy to cut and configure; its new structure provides much greater strength and much better flow characteristics than the single-walled pipe that was used many years ago; and, until the recent massive upturn in petroleum prices, it has been relatively inexpensive.

Catch basin construction varies. Pre-fabricated basins such as those manufactured by Nylo-Plast and NDS are durable and provide a very uniform look. But homemade basins, utilizing perforated risers fashioned from HDPE pipe with a poured-in-place concrete bottom can be just as effective. Even though plastic basin lids have become much stronger and more durable, it is hard to damage or misalign a round, cast-iron grate. When installing a basin, the slope in the immediate vicinity of the basin should be slightly greater than the surrounding area in order to avoid eventual puddling around the inlet.

Perforated drainpipe is most frequently HDPE, either slotted throughout or with larger round holes on half the pipe. If using the latter style pipe, install it with the holes toward the bottom on the trench. Gravel selection is a key factor in making a perforated tile system efficient. The superintendent is faced with the challenge of moving surface water into the drain lines while still managing to grow grass over the pipeline. Gravel that is too small can be plugged with silt or even result in a perched water table (remember a primary function of the gravel blanket in the USGA green is to perch water in the sand level). Gravel that is too large can result in a permanent eyesore and potential playing and mowing hazard. Half-inch stone is generally a good choice as backfill for perforated drains and perforated risers on catch basins. A shallow layer of coarse sand over the gravel can help facilitate turf growth while allowing water to penetrate into the tile line.

Flat tile, as opposed to the traditional round pipe, also has its applications. In rocky conditions, the installation of flat tile serves the primary drainage purpose without the expense of trenching and subsequent cleanup. It is especially useful in situations where it is important to maintain the integrity of the existing sub-grade – subsurface drainage in greens and tees and sand-plated fairways are good examples.

Vertically installed slit drains are also being used on golf courses. In new construction and renovation projects, this product is used as a conduit to transfer water at the interface of two different growing mediums (topsoil to sandcap, greensmix to topsoil are examples). This product can also be incorporated into slit drain systems of existing tees and greens, allowing drainage issues to be addressed with minimal disruption to play.





In summary, there are many factors to consider and many products to employ in the process of improving golf course drainage, but the quest for the perfectly drained golf course is ongoing. When the “worst wet spot” on the course is drained, what you have really done is promoted another troublesome area into the position of “worst wet spot.”

Tom Shapland is the President of the Wadsworth Golf Construction Company and the Immediate Past President of the Golf Course Builders Association of America. -OC

*Images courtesy of Tim Anderson, CGCS, Naperville Country Club and Michael Heustis, Chicago Highlands.*





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## MIDWEST BREEZES

Charles Anfield, CGCS, *Heritage Bluffs Golf Course*



### **"What's New with the New Guys?"**

Midwest Breezes was recently running through the 2008 membership directory and found some new names and some familiar names in new places with new jobs. So we checked in with four members and said "hey, what's new?"

**Question 1: *What has been your biggest challenge or adjustment in your new job?***

**Question 2: *What is the best thing about your new job?***

**Question 3: *What future plans do you have with your new job?***

#### **Andy Weadge, Morris Country Club**

Our first stop was to Morris Country Club to visit with Andy Weadge. Andy comes from five years as an Assistant Superintendent at Black Sheep Club. This is his first position as a Golf Course Superintendent.

It probably is just the unfamiliarity of working at a new club. I'm trying to learn a new course, with new turf varieties, meeting and learning about new people.

I would say, taking the knowledge of my school experience, my Assistant experience and putting it all together to manage a golf course on my own. I get to implement my own ideas and thoughts.

I'm working to get the greens into a sound management program. I'm also working on improving the clubhouse landscaping. Another project I'm proposing is to make improvements to our practice facility.

#### **Luke Strojny, Prairie Bluff Golf Club**

Our next stop was to visit with former MAGCS President Luke Strojny who is now Superintendent at Prairie Bluff Golf Club. Luke came from a 25 year tenure at Poplar Creek Golf Club.

The acreage of Prairie Bluff is so much larger than what I'm used to. Poplar Creek is 120 acres and Prairie Bluffs is 238 acres. The travel times and logistics of just getting around are so different. The exposure of the course is also a new challenge to manage. There just aren't as many trees. Prairie Bluff is so wide open, the turf tends to dry out much quicker. I've had to adjust my irrigation strategy.

There are so many nice people in the Lockport Park District organization. It's a smaller organization than what I was used to. It's so exciting to work at a new course after being at one course for so long. It's also been great to have Kenny Shepherd around. His shop is right next door and we have a great working relationship.

We're looking at some new irrigation projects. I'm looking at trying to improve on some of the details and just continuing to work on what Ken was already doing.

#### **Michael Heustis, Chicago Highlands**

We move on to the meet the new Superintendent at the currently being created course, Chicago Highlands. Michael Heustis, moves after two and a half years as an Assistant Superintendent at Chicago Golf Club and takes his first head job.

The most difficult thing I deal with is coordinating the different contractors who have different agendas and different personalities. My objective is to keep everyone moving forward toward a common goal.

The most gratifying thing for me is that someone trusted me enough to hire me to do this job. I'm flattered to be given this opportunity and be a major component of such a large endeavor. I'm learning so much new stuff.

There's so much. But overall my main objective is to get the irrigation system installed and on line so we can grow grass after the shaping and seedbed preparation is completed. We are shooting for a summer 2009 opening.

#### **Curtis Tyrell, Medinah Country Club**

The last stop we make is to Medinah Country Club. Curtis Tyrell has recently moved here from Fox Winds Golf Club, a 36 hole golf course in Connecticut.

I think most of the challenges are yet to be uncovered. I'm trying to get a feel for how things work and the growing conditions here in the Midwest. The size and scope of the property are also a challenge.

The challenge of my new position and the team operation that this job requires is very exciting. We're developing new plans to make some course improvements.

*(continued on next page)*

We're looking at renovating course #2. We are looking to redo the bunkers, renovate the tees and improve some drainage. We've also going to expand and improve the practice facility and short game area. Once I get my feet grounded I plan on attending some meetings and become active in the MAGCS. **-OC**



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