



Velvet Bentgrass - The Midwest - East Coast Connection

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In late September of this year, I had the good fortune of visiting the east coast for a fact-finding mission concerning velvet bentgrass (VBG) use on golf courses. Velvet bentgrass (*Agrostis canina*) is a misunderstood and underused golf green turfgrass. Since the 1930s, one of the few positive mentions of velvet was on the 1977 Jethro Tull album *Songs from the Wood!* Over the past decade interest in VBG has resurfaced due to inquisitive researchers and increased restrictions on maintenance inputs. Let's first explore VBG's history and current research, and then move onto how VBG is used in other areas of the country and its possible applications here in the Midwest.

Velvet bentgrass is a stoloniferous, fine-textured, dense turfgrass used mostly in the northeast and northwest areas of the United States. Introduced to the United States in the early 1900s as South German bent (75% colonial bentgrass, 15% velvet bentgrass, 1% creeping bentgrass, plus many impurities), it began segregating itself out over the next few decades. Golf course superintendents and researchers then began vegetatively propagating VBG in the 1930s for use on sod farms and additional golf courses. Seeded varieties soon became available but seed supplies were low, possibly due to early researchers using inbred material, thereby limiting the further adoption of VBG as a golf green turfgrass. Over-fertilization of early varieties of VBG was another reason it was not widely accepted. Of the few available early cultivars, many were of a much lighter green. When a turf manager is managing a turfgrass that is not

of a desired greenness, we all know that the fertilizer spreader will make an appearance! This over-fertilization (and most likely over-irrigation as well) led to thatchy, unattractive playing surfaces, especially when cut at yesteryear's mowing heights of .20-.25". This mismanagement was occurring when new and improved creeping bentgrasses were introduced in the mid 20th century, causing many courses to remove their failing VBG greens and switch to creeping.

Interest of and research on VBG never quite vanished. It was kept alive by the work of Dr. C.R. Skogley at the University of Rhode Island and by various researches at Rutgers University in New Jersey. Today, both of those universities are still highly involved in VBG

research, along with the University of Wisconsin-Madison. Part of my time spent on the east coast was at Rutgers University's turfgrass research station. Dr. Jim Murphy gave me a tour of the facility and his VBG research trials. Dr. Murphy's main VBG research focus is on cultural management of the newer velvet cultivars. Some of the factors he is investigating are fertility, thatch control, *Poa annua* control, ball mark repair and traffic stress. Rutgers also has VBG in their NTEP trials, both at green and fairway heights. Dr. Murphy's 'Greenwich' VBG putting greens are 6 years old and show no signs of non-sustainability, a sign that there is a very bright light at the end of the proverbial tunnel for velvet when managed correctly.



Velvet bentgrass among creeping bentgrasses at greens height at Rutgers University



Weekapaug GC VBG green aerification recovery at two weeks after aeration event.

Dr. John Stier has been conducting research on VBG at UW-Madison for the past 5 years. His projects have included both greens height turf and fairway height turf. A 2005/06 trial conducted by then graduate student Eric Koeritz compared VBG to CBG cultivars at various mowing heights and fertility rates found that the velvets maintained equal levels of quality with the creepings and the velvets were less susceptible to dollar spot especially at the low mowing heights. Koeritz also began a fertilizer type and rate trial on VBG grown on both sand and soil greens that is currently nearing completion. This trial looks at four types of fertilizer, each at three annual rates, and it is giving us a huge insight into what type of fertilizer will yield the highest and most consistent quality for VBG greens grown in the Midwest. The results of this trial will be published in early 2010 by me and Mr. Koeritz. Current VBG research projects are numbering a record high. Shaded greens were built in 2008 and treatments began



Dr. Jim Murphy, Manny Jr. and Manny III on one of Green Harbor's beautiful velvet greens.

this spring on a VBG versus CBG shade tolerance trial, using three fertilizer levels and absence/presence of a growth regulator. A low input fairway trial was seeded in 2009 that will compare fungicide and fertility needs across five different turfgrasses including VBG and CBG. A VBG versus CBG fertility at fairway establishment was conducted this fall in conjunction with the U of M. Preliminary results on establishment from the above few trials suggest that VBG has similar fertility needs to CBG at establishment. A VBG/CBG green establishment project this fall echoed that pattern. Research at UW-Madison has always been cutting-edge and now is no exception with the current and future VBG research.

Enough about research plots; let's discuss the "real" thing: golf courses! Dr. Murphy was kind enough to take me up the shore to Rhode Island and Massachusetts to speak with four superintendents that manage VBG greens. We visited courses at differing levels of maintenance standards, allowing for a complete view of the spectrum. In order of visitation, let's begin with Weekapaug Golf Club in Westerley, RI.

Weekapaug GC is managed by Superintendent Don Urso. It is a 9-hole private course built in 1967

and is located right on the Atlantic Ocean. Don manages native soil push-up greens originally seeded to Kingston VBG. He now overseeds with SR7200 at each verticutting/topdressing event, which is the backbone of his velvet maintenance program. There were two things that Don stressed with VBG: 1. Verticutting and topdressing at 14 day intervals is a must and 2. The members absolutely love the velvet putting surfaces! The greens are cut with a triplex at .120" and receive aeration in spring and fall using 5/8" tines on 2x2" spacing. Fertility is approximately 3.5 # N/M/yr using ammonium sulfate, granular in spring/fall and foliar applications in the summer. Fungicides are not needed except when anthracnose breaks out on the *Poa annua* and of course the pre-winter snow mold prevention. Three oz/A of paclobutrazol is applied every 10-14 days throughout the season. Irrigation is supplied at 60% ET replacement throughout the summer. These maintenance practices give Don's members consistent Stimpmeter ratings of 11-12'. The question to ask here is if any of these maintenance practices greatly differ from ours here in the Midwest.

Our next stop was Shelter Harbor Golf Club in Charlestown, RI. This was a picturesque private

course built in 2004 and is managed by Ed Walsh, CGCS. Shelter Harbor is a Hurzdan/Fry design and utilizes California style 100% sand greens. This style of construction has proven to be difficult to manage as a few greens still have fill-in/stabilization issues. The few problem areas are along the edge of the greens, at the sand/native soil interface. The absence of a perched water table coupled with the wicking nature of the soil cause these areas to be continually water-stressed, and this leads to thinning. . With that said, Ed's greens are overall in great shape and the members couldn't be happier with the velvet turf. But like a typical superintendent, by Ed's description, I could have sworn the greens were dead prior to actually seeing the problem areas! The day of our visit was the first day of a state amateur event and Ed's maintenance practices had the greens in tip-top shape. They are 'Greenwich' VBG fertilized with 4 lbs N/M (ammonium sulfate) per year. The greens are religiously verticut and topdressed every two weeks to ensure a smooth and firm putting surface. Aeration occurs in spring and fall using 1/2" tines on 2x2" spacing from which the velvet quickly recovers. Again, does anything strike you as out of the ordinary? We'll get to that answer in a bit.

The next day found Jim and me in Massachusetts starting at Belmont Country Club, a beautiful Donald Ross course, the original 9 holes built in 1918. Belmont is a private club (now 18 holes) that hosts only 15-20K rounds per year and is managed by Superintendent Michael Rose. His green complexes used to be native soil 'Vesper' VBG greens but were rebuilt to USGA specs (90:10, sand:peat root zone) in 2005 and sodded to 'Greenwich' velvet. The collars were then also sodded to velvet but were changed to Penn Trio, creating a wonderful



A "bad" area on Belmont Country Club's VBG greens, also two weeks post aeration



Shelter Harbor putting green two weeks after fall aeration event.

contrast in color. Mike's maintenance practices are again familiar to us all: Toro Flex mowers at .110", .10 # N/M and .125 oz Primo Maxx/M every 10-14 days, verticutting and topdressing every 14 days and periodic rolling, resulting in Stimps of 11-12'. Topdressing is not dragged in; Mike and his crew brush it in with soft shop brooms, greatly reducing the stress of vehicle traffic. Echoed by each superintendent is that verticutting is necessary when topdressing since velvet creates such a tight and upright canopy. The canopy must be opened for sand incorporation, even when using 1.5 mm sand. Next year Mike wants to go down to 1 mm sand to further aide sand incorporation. Irrigation is supplied by daily handwatering, which is on the extreme but Superintendents

love what we do and will stop at nothing for the best results! With that said, Mike and his general manager both stated the members would not trade their velvet greens for anything else. They love the color and playability of the velvet greens. It was an absolute pleasure to visit with Mike (and the past Superintendent) about the wonders of velvet greens!

My last stop was at a family-designed and -operated 18-hole public course built on, of all things, old cranberry bogs. Green Harbor Golf Club, located in Marshfield, MA, was built by Manuel "Manny" Francis, Sr. in the 1970s. Manny Jr. and Manny III now manage the property and were delighted to hear that I was from the #1 cranberry producing state (which is oddly somewhat centered around a

town also named Marshfield). You can guess which state is second behind us! Anyway, the Francis family has a strong tie to the history of VBG. Their operation started out as a sod farm, growing all types of bentgrasses. Land was slowly turned over to the current golf course layout, featuring all native soil push-up greens that were vegetatively propagated using stolons of 'Vesper' VBG from Vesper Country Club. Manny Sr. was the developer of 'Vesper' from when he worked at Vesper CC. Green Harbor is a low-input operation, using triplexes on the greens, tractor-pulled gang fairway mowers and a low green fertility rate of about 2.0 # N/M/yr. With that said the course was in excellent condition and packed with golfers! Manny III's only wish was that he could verticut and topdress more than three times per year since his only problem is the thatch level on the greens. Chemical inputs are only needed when the *Poa annua* gets hit with a disease. It was a great honor to meet and speak with the family responsible for developing one of the most popular velvet cultivars (it is our cultivar of choice here in WI for research). To interact with that much history is just amazing!

After this quick (or lengthy) overview of east coast velvet use, how does this translate to the Midwest? Let's make a simple comparison of climates. The primary cities of the Midwest are Chicago, Madison and Minneapolis/St. Paul. These cities are at latitudes 41.8, 43.1 and 45.0, respectively. The sites I visited on the east coast (Newark, NJ, Rhode Island and the Boston area) are at latitudes 40.7, 41.5 and 42.4, respectively. As you can see, the latitudes do not differ by more than a few degrees. A bigger and more important difference could be in the USDA Hardiness Zones. The Hardiness Zones are separated by annual

average minimum temperatures. The Midwest is comprised of zones 3b to 5a (-30/35 to -15/20 degrees F) while the east coast area mentioned before is of zones 4b to 6b (-20/25 to 0/-5 degrees F). So while the Midwest does have lower temperatures than the East coast during the winter, we are well-versed on how to deal with the accompanying diseases/conditions. Our VBG at the OJ Noer has always come out of the winter as the "shining star".

Because there is not much velvet in use on actual golf courses in the Midwest, one of the main reasons for my travels was to see how velvet stands up to daily play. Questions I received at this summer's Field Day regarding velvet were mostly along the lines of aerification and ball-mark recovery. VBG, while denser, is not as aggressive as CBG so Midwest Superintendents have been skeptical on how quickly greens can recover from stress events. Three of the four courses I visited had aerified their greens only two weeks before my arrival and before I was told the timeframe, I assumed it was four or five weeks prior! At two weeks post-aerification the greens were smooth and recovering well, very much like a creeping green would be. At each course I specifically asked to see a couple par-3 greens, as they are the usual suspects for the most ball-mark damage. Velvet recovers the same (or quicker) than CBG. Absolutely none of the greens looked like the mine-field this cautious Midwest turfie envisioned! My theory is the slow growth of velvet is off-set by its higher plant density. When individual plants are damaged by ball-marks or traffic there are simply more surrounding plants available to move in.

So is velvet applicable to the Midwest and does it have any advantages over traditional creepers? Yes and yes! As seen in

the case studies above, management practices are comparable to our current methods. We already spray/verticut/topdress on 10-14 day intervals for "high-input" CBG greens. We also hand water hot spots, roll when necessary and manage the *Poa annua* population. Velvet fertility needs are similar, if not lower. So what's the advantage? What's becoming more and more regulated each year? Water usage and chemical product availability. Velvet uses less water than creeping. At the OJ Noer, for years we have been irrigating velvet on sand at 75% ET replacement and on soil at 60% ET replacement, each only three to four days per week. This is prolonged, sustainable deficit irrigation that does not result in a decrease in quality; a huge plus. Did the above courses have complicated chemical programs? Not at all; if any products were applied it was on an as-needed basis for the *Poa annua* (and since velvet is so dense, it keeps *Poa* populations much lower). Imagine if you did not have to spray for dollar spot. What might that save you in product and labor costs? Again, at the OJ Noer, our sand and soil velvet greens had one outbreak of dollar spot in the last few years. Aside from snow mold prevention, they have been nearly chemical-need-free.

These observations have greatly calmed my cautious fears of adopting velvet bentgrass for use as a Midwest turf. I hope they have given you something to think about during the upcoming off-season. While velvet bentgrass is not the end-all for green turfgrasses, it definitely has many positive attributes that should place it as a top contender for future use in the Midwest. Thank you for reading and thanks again to Dr. Jim Murphy of Rutgers and all the Superintendents for their generous hospitality. 