

# Superintendents report success interseeding bentgrass into poa annua

By Doug Brede, Ph.D.

**T**OM Brain is a natural skeptic. "Years ago I always thought the interseeding we did was a waste of time and money," said the superintendent at Burlington Golf and Country Club, an 18-hole private course in Burlington, Ont.

"After aerating you'd see the bentgrass coming up—germinating in the holes—but then it would just kind of disappear."

Fast forward to today and Brain beams with the success of his seeding project.

"We've got bentgrass coming in and coming in, and now we're seeing it spread. Some of those patches are starting to coalesce together. I definitely think we're seeing success getting the T-1 bentgrass established."

Brain describes the greens on his 40,000-round Hamilton-area course as "a little on the small side and heavily shaded." In the past they were *Poa annua*. It was only through adopting new planting and management techniques and varieties bred for interseeding, that he was able to turn the tide on *Poa*.

In this article I'm going to describe the experiences of three Ontario superintendents who made the commitment in 2006 (when my original article appeared) to switch their golf courses from *Poa* to bent while it was in continuous play. They did it through interseeding—planting seed into an existing grass canopy. I'm also going to share the results of research studies I conducted in three U.S. states bordering Canada, to shed light on phenomena underlying interseeding. This article is the first time these trial results have appeared in print.

## Three experiments

Researchers use experiments to answer questions. Back in 2006 after writing what we knew at the time about interseeding, our next question was: What is the best technique for incorporating seed into the putting surface?

My study looked at simple techniques of aerification, grooming, spiking, and top-

dressing at two daily fee courses. Since that time, there have been some incredible seeders released from industry for dimpling and slicing in seed that we plan to look at in future work.

Downriver and Esmerelda golf courses are two very old municipal courses in Spokane, Wash., comprised almost exclusively of *Poa annua*. In this experiment, Alpha and T-1 bentgrasses were interseeded at 2 lbs./1,000 square feet (10 g/m<sup>2</sup>) onto the practice greens using four methods. All treatments received seed and topdressing. The greens were left unmowed for one week following seeding. Plots were visually rated afterward for per cent bentgrass.

The Downriver green is heavily shaded in spring and fall and sees full sun only in summer. After three years of monitoring, plots contained 36 to 53 per cent more Alpha bentgrass where the surface was disturbed by aerification etc., compared with plots that received seed and topdressing only. T-1 had

*This is an update to an article by Dr. Brede which appeared in the September/October 2006 issue of Turf & Recreation*

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about the same establishment rate across all techniques, including topdressing only. In total, Alpha and T-1 averaged 73 per cent bentgrass cover across treatments.

The green at Esmeralda is in full sun. Ten weeks after seeding there was already an average of 27 per cent T-1 and Alpha in the seeded plots. Grooming gave an 83 per cent advantage in Alpha establishment. Aerifying had a 56 per cent lead over spiking. With T-1, grooming gave 22 per cent better establishment compared to the topdressed control. Aerified plots had 48 per cent more bent than spiking.

Today, all establishment methods are reading about the same. Without any additional interseeding or special cultural practices, T-1 and Alpha populations rose to 63 per cent. Every autumn the bent levels dip slightly (to 57 per cent in October 2008) as more *Poa* volunteers.

In these two experiments, there were no repeated interseeding events, no growth regulators, and no tailored fertility programs. These green studies validate the aggressiveness of T-1 and Alpha. Our conclusion was that the establishment method strongly influences bentgrass coverage during the first months after seeding. Grooming and aerifying do seem to benefit. But after a year or two, establishment method was relatively unimportant as the bent spread and filled

## Updated Checklist for Successful Interseeding

- ✓ **Right time of year** – Late May, June, and early July. Don't waste your time with autumn. That's when *Poa* is germinating.
- ✓ **Use *Poa*-competitive varieties** – Newer varieties like T-1 or Alpha were bred for interseeding.
- ✓ **Don't skimp on the seeding rate** – Optimal interseeding rates are 2 to 3 lbs. per 1,000 ft<sup>2</sup> (10-15 g/m<sup>2</sup>).
- ✓ **Plant seed into soil** – Get the seeds below the leaf canopy and into green. This can be done through aerification or topdressing or with specialized equipment.
- ✓ **Mow continuously through the process** – No need to abandon mowing during grow-in.
- ✓ **Mow without the grass catchers for a couple days** – Drop the catchers or you'll be throwing away much of the seed you just planted.
- ✓ **Use the right seeding tool** – Dimple or slicer seeders offer little surface disruption. But interseeding can be done simply with aerification and topdressing.
- ✓ **Commit to a 2-3 year program** – Even a good interseeding job will take time to show results. Don't give up prematurely.

voids on its own.

### Fairway seeding rates

Bunker Hills Golf Course in Coon River, Minn., was the site of the 2008 Minnesota State Open. It was on this *Poa annua* course near Minneapolis that we seeded plots of T-1 and Alpha across two fairways using a Tri-Wave 60-inch seeder (Turfco® Manufacturing Co., Minneapolis, Minn.) at seeding rates of 1, 2, or 4 lbs./1,000 square feet on June 8, 2007. We repeated the study on Aug. 2, 2007 at Green Valley Country Club, a private club with *Poa annua* fairways near Philadelphia, Pa.

Results from both sites were remarkably similar. At Bunker Hills, seeding at four pounds gave 50 per cent better Alpha coverage and 22 per cent better T-1 coverage than seeding at 1 lb./1,000 square feet, evaluated one year after planting (see graph). Interestingly, higher seeding rates don't seem to produce weak, frail seedlings as some people have suspected. Instead they seem to bolster the bentgrass seed bank in the soil, with seed waiting to fill ball marks, etc. In

terms of practicality, four pounds is probably too high for most folks' budget. A good balance between performance and cost appears to be 2 to 3 lbs./1,000 square feet.

### "To mow or not to mow...?"

I was speaking to a superintendents group in Denver back in 2006 on the subject of interseeding when a young superintendent raised his hand and asked a question that left me stumped: "Do I do anything special after interseeding in terms of mowing?"

The question seemed simple enough, but the underlying concepts were complicated. 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 bent.

After puzzling over the question for what 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

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answer but came up empty handed. So I decided to plant a trial on our *Poa annua* test green here in Idaho. By this time autumn was approaching, so I realized the timing was not optimal to favour bent. But rather than wait nine months for better timing, I decided to interseed in early September—a worst-case scenario for interseeding. (Don't try this at home, boys and girls!) That's the time when *Poa* is at its fittest.

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

Unexpected results. Table 2 illustrates the progression of Alpha's coverage as affected by mow treatment. By the end of one year there were few differences. A trend emerged in year two, indicating less plot fill in the "skip week 2" treatment. That's the week when bent seedlings would typically 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 injury from the mower.

Fungicide treatments were striped across the mow treatments in a crisscross fashion two months after interseeding. The high rate of PCNB had a slight detrimental effect on bent populations in second-year numbers, presumably 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 more and healthier *Poa* and less bent.

Therefore, 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 degree of stress (anthracnose, drought, etc.) on the *Poa* to help discourage it.

#### Burlington Golf and Country Club

Four seasons ago, Tom Brain changed just about everything he was doing to interseed. Before 2006, he would seed in September using low rates of another variety. He waited. And not much happened.

"We never really saw a whole lot of catch," he says.

Today he's seeding in early summer with repeated applications at one to two pounds of T-1/1,000 square feet each time. He interseeds on a three-week regiment, starting in late May and finishing up in July. That's a

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total of three or four times per year when you consider dodging tournaments and the like. Brain's weapon of choice is a Bannerman Simple Dimple seeder, which consists of a rotating drum with short spikes to poke the seed into the green. A hopper drops the seed at a fixed (non-adjustable) rate.

"Sometimes we'll topdress afterwards and sometimes we don't," he says. "Frankly to be honest, it's more of a matter that the topdressing is going to screw up my mowers."

Interseeding takes place during normal play on the course. "The dimple seeder doesn't make a heck of a lot of damage or disruption to ball roll. But sometimes, like when we have a ladies' event the next day, we'll topdress just to make it a little smoother."

Brain says he didn't notice T-1 establishing until the second season of the program. So he cautions superintendents not to give up on the process too soon if they don't see results immediately.



Lookout Point superintendent Aldo Bortolon is able to keep his greens at least 50 per cent bent. He has been interseeding for 25 years, the last four of which he considers highly successful.

"T-1 really seems to come up early in the spring. When we take off our winter covers, the T-1 is already fairly long and quite identifiable. Typically in the spring your bentgrasses are lagging behind, while your *Poa* is up and growing. Seeing T-1 then is quite amazing."

On greens that used to be 100 per

cent *Poa*, Brain feels he's reached at least 50-50 bent, which he's happy with. Naturally, being a shady, undulating course, there are areas with higher or lower amounts of T-1.

"There's no question that our sunniest greens are getting more bent. Which is not to say that our shady greens aren't. Interestingly, in the cleanup pass we seem to be getting quite a bit of T-1—that typically is where you would think it would struggle the most. You'd expect with the extra compaction, that *Poa* would do better. And certainly on humps, rolls, and false fronts on our greens, bentgrass seems to be getting in

better there than just about anywhere else."

#### Lookout Point Country Club

A history of winter damage on old *Poa* pushup greens is what led superintendent Aldo Bortolon to consider bentgrass interseeding. Bortolon has worked at Lookout Point for 35 years, the last 25 of which he has been interseeding. Lookout Point is a highly-rated, 87-year-old private course in the Hamilton/Niagara Falls region. Forty-thousand rounds per year are concentrated on Aldo's tiny 3,000-square-foot greens.

Bortolon has tried a variety of techniques, timing, and machines to make interseeding successful.

"Traditionally in the past we were using just standard half-inch hollow tines. And we would seed in September with one pound of (another variety) on the one occasion," he says as he explains why interseeding didn't work.

"Then in '06 we started using T-1. At that time we changed our aerification practices to quarter-inch hollow tines in May, quarter-inch solid in July, quarter-inch hollow in September, and then half-inch solid Vertidrain the first Monday in November. Just as of last year, we started doing Dryject aerification in July, replacing the quarter-inch solid tines."

Bortolon has been seeding T-1 at 2 lbs./1,000 square feet, topdressed directly behind his May and July aerification.

"Since we've been using T-1, we've noticed a remarkable difference in the bent coming through, as opposed to anything we've used in the past prior to that. It just seems like it's just that much more of an aggressive turf to do what we really want it to do," he says.

Last year, the greens at Lookout Point had some issues with crown hydration damage from ice in the low spots over winter. When noticing it in the spring, Bortolon was glad he embarked on interseeding.

"The T-1 certainly came up nicely, and we have a good stand of it in those low-lying spots, which is great. Nobody wants to see ice damage. And it's great the following year when you know you have a lot of bent in those areas. It sort of helps you through your future."

Bortolon maintains his greens at .135 inch with Toro 1000 walk-behinds and grooved rollers. At this point he figures he's got 70 to 80 per cent bent in areas with less compaction.

"In areas where they're continually walking on and walking off, certainly where foot traffic is predominant, there's a higher percentage of *Poa*. I'm going to say that on the average we're 50-50 bent and *Poa*. But what



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Superintendent Dennis Piccolo points to the new bentgrass on his fairways at the St. Catharines Golf & Country Club. Since starting his interseeding program with T-1, his fairways have soared from 100 per cent Poa to 70 per cent bent in three years.

"I'm noticing is that every year we're increasing the percentage of bent. And in areas I never would have imagined."

#### St. Catharines Golf and Country Club

Superintendent Dennis Piccolo approached interseeding with a vengeance. He's not just seeding greens at St. Catharines, but approaches, collars, tees, and fairways as well.

St. Catharines is a 30,000-round private course with a 100-year history, situated in the heart of the Niagara region. It was host to the 2006 Ontario Ladies' Amateur Golf Championship.

Piccolo credits his success in interseeding to using the right machine, the right grass, and of course, lots and lots of sand.

"I topdress first, heavily with sand, before I seed. Then when the dimple seeder goes through, I feel it is giving a bed for the seed to germinate. If you've got a lot of thatch and you just dimple seed into the turf without the ability to cover the seed, I don't think it catches well. I think sand is key," he

says.

Piccolo relies on brick sand, also called masonry or mortar sand, which is different than regular concrete sand. Brick sand is available almost everywhere and has a better grading for topdressing—fewer fines and fewer coarse particles. He has brick sand delivered to the course by tri-axle trucks.

"I spread it on fairways with our salt spreader. Instead of having to buy a \$40,000 topdresser, we just use a salt spreader—the kind you would slide in back of a pickup. So rather than asking your greens committee for \$40,000 to start an interseeding program, just use what you use to maintain your park-

ing lot in winter."

He spreads about a quarter-inch of sand on fairways before topdressing 1.5 to two pounds of T-1/1,000 square feet using a dimple seeder. Same goes for tees and greens. Piccolo recently switched to a Speed Seed dimple seeder, which he says has bigger dimples and allows an adjustment of seeding rates, not just one fixed rate. For the future he has his eye on an AerWay Super Fine seeder, which has a spiker with lots more tines.

This year he aerified greens in mid-June with 5/8-inch hollow tines, topdressed, applied seed, and dimpled it in. Then he

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brushed the surface. Afterwards, he waited five days before resuming mowing.

"I leave them alone for five days and allow the seed to germinate. I let my grass grow back up through the sand. I feel the seed is kind of protected that way. Golfers are usually mad that I just sanded the greens. They don't know that I'm letting seeds germinate."

In four seasons of interseeding, Piccolo estimates his fairways have gone from 100 per cent *Poa* to 70 per cent bent.

"I can definitely allow the fairways to dry up now, and I can see the bent doing better than the *Poa*. I've made my members extremely happy by being able to run the place a lot drier. They're getting these 'Superman drives' and they love it."

On fairways, the only seeding skips have come from when the dimple seeder rides over top of the low spots. Driving in different directions tends to help. Piccolo estimates that his greens and tees are now 50 per cent bent. The toughest place he says to interseed: tees and collars.

#### Recommendations

As these three superintendent's stories have illustrated, interseeding can be done

Bentgrass cultivar	Establishment technique	31Jul08	1Sept08
Alpha	Topdressing only	38	58
	Spike	49	81
	Aerify	61	80
	Groom	64	75
T-1	Topdressing only	67	75
	Spike	51	61
	Aerify	61	71
	Groom	54	79

**Table 1.** Planting method had a big effect on the quantity of bentgrass establishing in the first few months after interseeding a practice putting green at Downriver Golf Course in Spokane, WA. But two years later, there were only minor differences between plots in bent coverage.

with or without special equipment. The only upfront cost is a few buckets of seed, which Piccolo is quick to point out "is a lot cheaper than fungicides." Modern dimple and slit seeders make the process easier, offering excellent seed incorporation with little or no surface disruption.

But with interseeding, don't expect instant gratification. It may take months or a year or more to see results. Piccolo urges golf courses dabbling in interseeding to "stick with it more than one season. Don't give up after one year. If you're going to do it, commit to two or three years worth of topdressing and seeding.

"And don't try to do it like in the old days with three-quarters of a pound of seed in the fall."

On his first attempt to interseed four years ago, Piccolo seeded one

green at four pounds, "which is outrageous," he says. "But that green was so far ahead of the others that at a month there were no voids anywhere."

Tom Brain concurs: "If I could get away with it, I would interseed more often through the summertime. Doing it through the summer is crucial, and putting down as much seed as you can afford is, too. It's made a believer out of me."

*Doug Brede is research director and one of three managers of Jacklin Seed, part of the J.R. Simplot Company in Post Falls, Idaho. Previously, he was associate professor of turfgrass management at Oklahoma State University. Prior to graduate school, he managed a 27-hole golf course near Pittsburgh, Pa. He is the developer of more than 60 turf varieties, including Nu Destiny Kentucky bluegrass, which ranked No. 1 in the National Turfgrass Evaluation Program trials. His research team has developed, released, and patented top cultivars in 10 other grass species. He has written more than 100 articles on turfgrass science, including a book entitled, "Turfgrass Maintenance Reduction Handbook," that describes ways to optimize your maintenance budget. He is the 2008 recipient of the Innovator of the Year Award from TPI.*

% bentgrass	6Sep07	8Oct07	8Jul08
Mow treatment			
Continuous mowing	23	32	51
Skip week 2	18	24	48
Skip week 3	23	34	48
Skip week 1	23	29	43
Skip weeks 1,2,3	21	30	42

% bentgrass	6Sep07	8Oct07	8Jul08	Poa health 8Oct07
Fungicide treatment				
Glacier 4F PCNB 6 fl. oz.	24	32	51	3.6
Instrada 5 fl. oz.	22	28	50	3.6
Check	21	28	50	3.8
Glacier 4F PCNB 12 fl. oz.	23	34	44	3.7
Banner Max 4 fl. twice	18	26	37	5.6

**Table 2 (above left and right).** Continuously mowing through interseeding produced slightly more bent coverage than skipping a week or more of mowing. Skipping week two was the hardest on the bent. That's likely when seedlings were germinating and shading was detrimental. Plots were seeded to three lbs. Alpha on Sept. 13, 2006, topdressed immediately at 1/2 yard per 2,100 square feet and dragged in. The second table shows fungicide treatments on the same plots, sprayed two months after seeding. Poa health was rated on a 1-to-9 scale, with 9 the healthiest.

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