

A classic example of how we can bring change to a turfgrass population was the occurrence of bacterial wilt. It's an old story but one worth telling.

Originally selected in 1936, Toronto (C-15) creeping bentgrass became widely established on putting greens from the 1950s through the 1970s in the Midwest and eastern United States for its fine texture and high shoot density. What made Toronto or C-15 unique compared to the creeping bentgrass cultivars we have now is that it was established vegetatively, which in a large measure provided its uniform surface. A disadvantage was that each plant was identical resulting in a genetically uniform (in theory) plant population.

In the mid- to late 1970s, Toronto greens began to decline rather rapidly under late spring conditions, most noticeably in the Chicago area but throughout the Midwest and Northeast. Coincidentally — and I might be twisting history to fit my story — the severity of “C-15 decline” coincided with the release of the Stimpmeter. At the time, symptoms often didn't appear on the relatively higher cut collars of Toronto bentgrass.

Numerous reasons were put forth as the cause of the decline, but in the early 1980s Michigan State University turf professor Joe Vargas and a graduate student used an electron microscope to discover the cause of C-15 decline was a bacterium named *Xanthomonas campestris pathovar graminis* and termed the disease bacterial wilt. The rod-shaped bacterium would get into the xylem vessels, multiply and clog the water flow in the plant, which resulted in the turf plant wilting.

Bacterial wilt was difficult to control and required multiple applications of an antibiotic, which was applied in 25 times the normal gallonage that you'd use for a fungicide at night. Needless to say, this type of control program was not sustainable for almost all golf courses that suffered this problem.

The popular decision was to renovate the

Lessons Learned From Bacterial Wilt

BY KARL DANNEBERGER



TODAY, BACTERIAL
WILT REMAINS A
CHRONIC PROBLEM
ON *POA ANNUA*
GREENS MAINTAINED
UNDER STRESSFUL
CONDITIONS

greens. And in doing so, I believe this was the first time methyl bromide was used on a wide scale on northern putting greens to kill the turf, sterilize the soil and kill the bacterium.

During the early and mid-1980s, there weren't many creeping bentgrass cultivars from which to choose. The most popular cultivars were Pennncross.

The concern at the time was if Pennncross or any seeded bentgrass cultivars would become infected. Fortunately, that didn't occur — and hasn't. The bacterium was extremely host specific to Toronto bentgrass, and actually specific to certain sod fields from which it came. Also, seeded bentgrasses by their nature are more genetically diverse.

Subsequently, a bacterium was reported by the same researchers at Michigan State on *Poa annua* and named *Xanthomonas campestris pathovar poaannua* and later marketed commercially as a *Poa annua* control. Subsequent studies at Rhode Island identified the bacterium as *Xanthomonas translucens pathovar poaannua*. Today, bacterial wilt remains a chronic problem on *Poa annua* greens maintained under stressful conditions.

Lessons that continue to be learned are that unpredictable changes occur once a turfgrass population becomes disturbed or stressed beyond what it normally has experienced.

As we continue to maintain turfgrasses in environments or under conditions that are on the extreme fringes of adaptation, new and unpredictable changes will occur — and not always for the better.

Karl Danneberger, Ph.D., Golfdom's science editor and a turfgrass professor from The Ohio State University, can be reached at danneberger.1@osu.edu.