The Supreme Weed

BY T.R. MASSEY

KEEPING *POA ANNUA* OUT OF BENTGRASS REMAINS A CHALLENGE

A weed by any other name would grow as green.

Depending on whom you ask, annual bluegrass, or *Poa annua*, is a nuisance that should be ferreted out of a golf course or a wonderful grass that makes an attractive playing surface.

"At Oakmont, the Olympic Club, Winged Foot and Westchester – two thirds of the U.S. Open courses – it's managed as a playing surface," says David Huff, an associate professor of turfgrass breeding and genetics at Penn State University who conducts research about *Poa*. "It's a weed, though."

Although it can provide a nice playing surface, *Poa annua* is a remarkably invasive species.

"This organism is just fascinating from a biological perspective," Huff says. "It grows on every continent, including Antarctica. Here's an organism that has covered the face of the planet."

Ron Calhoun, an environmental turfgrass specialist for crop and soil sciences at Michigan State Uni-

versity, says *Poa* is amazing because it changes to thrive in conditions where it's growing.

"What's cool about it is it's 95-percent inbred," Calhoun says. "If you have a plant that can survive under a certain set of circumstances, that plant is going to produce seed that will also survive in that situation. You develop your own personal *Poa* population that's ideally suited to subenvironments on the golf course. It can produce seed at any mowing height and can be viable quickly. Most seed takes two weeks. There's some evidence that Poa takes only a day or two. It's unique among grasses."

But so far, no one has come up with a marketable seed for *Poa*.

"If you're a new course, what do you do?" Calhoun says. "You can't buy *Poa* seed. You have to buy aggressive bentgrass seed. You spend thousands, and if you are vigilant from day one, you can try to keep it out. If you try to restore 10 to 40 percent, you can't do it."

KEEPIN' IT REAL

John Zimmers, golf course superintendent at Oakmont Country Club (home of the 2007 U.S. Open near Pittsburgh), has been tending the club's 100-year-old *Poa* greens for the past eight years.

"You try to manage what you have," he says. "We manage our *Poa*, and we've learned what we need to do and keep it healthy, syringing it with lots of aerification and topdressing and drainage. Ours doesn't do as well in damp conditions because perennials do better in the dry conditions. Our greens hold up well under dry conditions."

Oakmont's turf is a perennial *Poa* that's a much higher quality than other types found throughout the world, and it doesn't seed much, Zimmers says.

"It's slow to grow and recover and slow to move laterally after aerification," he says. "However, you can cut it shorter than any other grass I've seen. It's the most unique *Poa* I've seen. I can cut below $^{3}/_{32}$."

OUT OF HERE

Ray Viera, superintendent at Hamilton Farm Golf Club in Gladstone, N.J., believes *Poa* is a disaster waiting to happen.

"As you lower mowing heights and turn up the heat, it's a collision course," he says. "It's not an ideal grass for high-profile places anymore. When people want fast greens, you're bound to fail. It's torture."

With a grow-in, it certainly takes an enormous amount of planning in preconstruction to keep *Poa* away, Viera says.

"You have to anticipate when you plant," he says. "The quicker you deal with it, the less chance a stand establishes. Quick coverage is key. It's not chemicals. You can't 'preout' *Poa annua* on soil where you need to germinate grass. You have to have good watering practices and understand *Poa annua* is in that ground before you start. You have to keep it clean from the beginning. Then you have to cut it out, then keep it managed with chemicals."

At Hamilton Farm, Vierra has only a small population of *Poa*.

"We're on top of it," he says. "We use Cutless, which is toxic to *Poa annua*. It's great for bentgrass regulation. We've been using it, and the *Poa* stays out."

About one-third of Vierra's pesticide budget is allocated to growth regulators, which are used to control *Poa*, among other things, so it's hard to quantify by dollar amount.

If you spend a lot of money on a new construction or renovation project and plant any number of bentgrass varieties, *Poa* isn't a welcome visitor. Take the course at the exclusive Double Eagle Club in Galena, Ohio. It's a Tom Weiskopf/Jay Morrish design that's maintained in as near perfect condition as it can be daily. Fewer than 10,000 rounds are played there annually.

"We're 99.5 percent *Poa* free on the greens, which is remarkable for 16-year-old greens," says superintendent Todd Voss.

One of Voss' first defensive screens is having every person's golf shoes changed and cleaned.

"It helps us control what spikes our people are wearing, and it has an added benefit of keeping people from bringing in *Poa* on their shoes," he says.

When Double Eagle was built, it was a virgin field with mature woods, so there was little *Poa* on site.

"Our first *Poa annua* came in through bluegrass sod," he says. "The sod source is more important than anything else."

Voss warns others to be extremely vigilant when screening sod and seed sources and suggests starting programs that keeping *Poa* off a property.

At Towson Golf & Country Club, Velocity is the cornerstone of Quent Baria's *Poa* control program. Photo: Heather Wood

"For the first 15 years, we mechanically removed it with forks and knives – we basically cut it out," he says. "Most courses don't have the time or labor to make it as big a priority, but for us, it was. It's aggressive. If you see one spot one year, then it's 20 spots next year. It's meant to survive. It reproduces quickly. It's an amazing plant."

Voss also experiments with different chemicals to retard *Poa* growth.

"Statistically, they work, and if you're trying to go from 60 percent to 20, it can work," he says. "If you're trying to go from 3 percent to none, it doesn't work."

Even though Voss is determined to keep *Poa* at bay, he doesn't condemn the plant.

"What is wrong with *Poa*?" he asks. "It can be a fabulous grass. The problem with *Poa* is

the transition. You go through years of being new or renovated, and you start getting *Poa*. Then when you have about 30 percent *Poa*, you get those bumpy conditions that no one likes. Then once you get to 60 to 90 percent, those complaints stop. It's the transition time – that's the problem."

Quent Baria, superintendent at Towson Golf & Country Club in Phoenix, Md., is a believer in Velocity herbicide for *Poa* control.

"It's the cornerstone of my program," he says. "It's so effective. Three years into the marketplace, I'm surprised it hasn't had more press. It's extremely selective and effective."

But there's an educational process the membership or clientele must endure when using the product, Baria says.

"You'll be looking at some voids in your turf," he says. "But that's a good thing. You have to rely entirely on the creeping nature of the bentgrass to take over where the voids are and you have to be patient."

If the voided areas are too big, the *Poa* will come right back, Baria says.

"If you don't use a preemergent the whole time, you'll just get the *Poa* back," he says. "You didn't acquire it in a year or two, and you probably shouldn't try to get rid of it in a year or two. I have significantly cleaned it up. I've demonstrated I can win the battle in the short term."

At The Country Club at Castle Pines in Colorado, Sean McCue uses Bensumec and either Velocity or TGR to controal *Poa*. Photo: The Country Club at Castle Pines

At The Country Club at Castle Pines in Colorado, the 22-year-old course has 10 to 25 percent *Poa* on its greens and 30 percent on the fairways.

"We treat greens, tees and fairways preventively as well as postemergently," says golf course superintendent Sean McCue, adding that he uses Bensumec as the preemergent herbicide and either Velocity or TGR after *Poa* has emerged. "About 20 to 25 percent of my chemical budget is allocated to controlling *Poa annua*," he says.

McCue says it would be nice to reduce the *Poa* population, but realistically, he doesn't believe it will happen.

"But agronomically, if we provide nutrition for the desired species, we can reduce the *Poa* with chemical treatments," he says. "We're beyond the point of physically cutting it out. Our populations are too large for that to have a positive impact on things."

ADVICE

Calhoun asks those superintendents who are thinking of ridding their golf courses of *Poa*: Have you made a sober assessment of your *Poa* population?

"When it dies, it's so ugly," he says. "If you have *Poa*, you have to look at it as a renovation. Some products can give us some control, but it's hard to take grass out of grass."

There are postemergent products on the market, including Velocity, but superintendents must be careful with it, Calhoun says.

"Are you going to put that down a week before your member-member?" he says. "It selectively takes out annual bluegrass, but the rub is that it takes several applications. So you have to watch the *Poa* die. It turns the color of a manila folder, and it's not subtle. If you have more than 20 percent *Poa*, you're looking at Velocity as a selective renovation. It's like using Roundup, except you get to keep part of your bentgrass."

Often, when superintendents approach Calhoun, they either want to manage *Poa*, manage bentgrass or manage what's there. For 5- to 8-year-old golf courses, Calhoun usually advises aggressive regulator programs that slow the *Poa* more than the bentgrass to give the bentgrass a competitive advantage. Cutless and Trimmit are the two big products for that, he says.

"For the first 25 years they were available, when we applied them in spring and fall, we'd see a lot of injury to the annual bluegrass, but the bentgrass wasn't really growing at that time of year so there wasn't any gain," he says. "At the University of Kentucky, they did research and found you should apply it during the growing season. That gets them to 85 or 90 percent. The last part has to be done by hand."

But before a superintendent makes a decision, he must know what kind of *Poa* he's dealing with.

"Not all *Poa* is the same," Huff says. "It's a world apart. It's a different grass altogether. I don't know how pervasive that knowledge is."

"You're not talking about a single plant," Calhoun says. "Because it can adapt, it changes over time and by site. Because it's inbred, it can produce another *Poa* plant that's also ideally suited. It thrives in its situation. That's why it's the supreme weed." GCI

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In search of a silver bullet

David Huff, an associate professor of turfgrass breeding and genetics at Penn State University, is in search of a silver bullet for Poa annua.

"No one has pulled back the curtain on it yet," he says. "We can't kill it, and we've had difficulties eradicating it. We've been on it now about 12 years."

Poa annua, or annual bluegrass, is an invasive species listed on a noxious weed list in 13 or 14 states, Huff says. When it enters a golf course, it evolves rapidly.

"It adapts exactly to the level of management you're giving it," he says. "It takes several decades for it to get there, but once it's there, it can propagate true types. It has this amazing ability to adapt to about anything that you throw at it."

Despite a lot of research, Huff hasn't figured out how to keep Poa at bay.

"Other than taking a knife and never letting it get established," he says. "Work it into your management scheme and your budget. You have to send guys out with buckets and tools to cut the plant out. Go to the nursery, get some bent samples and replace the Poa with it."

Huff's research is working toward producing a seed from the desirable types of Poa. "Eventually, we'll have the seed," he says. "The high quality types, the ones better than the best bentgrasses is like nothing else. There's a negative relationship with seed production. The highest quality is mostly perennial and doesn't produce many seeds. We have some types that produce no seed – there's only vegetative growth. The other end of the spectrum are ones that produce seed. When you put any stress on it, they shut down and go to seed production."

The problem, or wonder, of the plant is its genetic instability.

"They're so unstable they can adapt rapidly," Huff says. "That's what gets them in there." GCI

Article and photos by David Wolff

PGRs: the superintendent's multitool

At Sun City Carolina Lakes, superintendent Aaron Nolan says he has improved turf consistency 20 percent through plant growth regulator use.

New uses for growth regulators seem to emerge daily

Rick Tegtmeier has declared war on *Poa annua*. One of his weapons – the plant growth regulator Trimmit. The director of grounds at the 36-hole Des Moines Golf & Country Club in Iowa uses the chemical on his A-4 bentgrass greens.

"Trimmit helps the bentgrass by holding the *Poa annua* in check and even taking it out," he says. "We have a dense, compact, upright surface that's still smooth in the evening after a day's growth."

Tegtmeier also uses growth regulators in the fairways. For the first two applications in the spring, he uses a combination of Primo and Proxy to control *Poa annua* seedheads. Beginning in mid-June, he switches to Trimmit to slow the growth of *Poa annua* while the bentgrass is actively growing.

"On greens, we apply Trimmit from spring until the first frost," he says. "It's a light application every two weeks. There's another application just after aerification to help control any *Poa annua* that might have germinated."

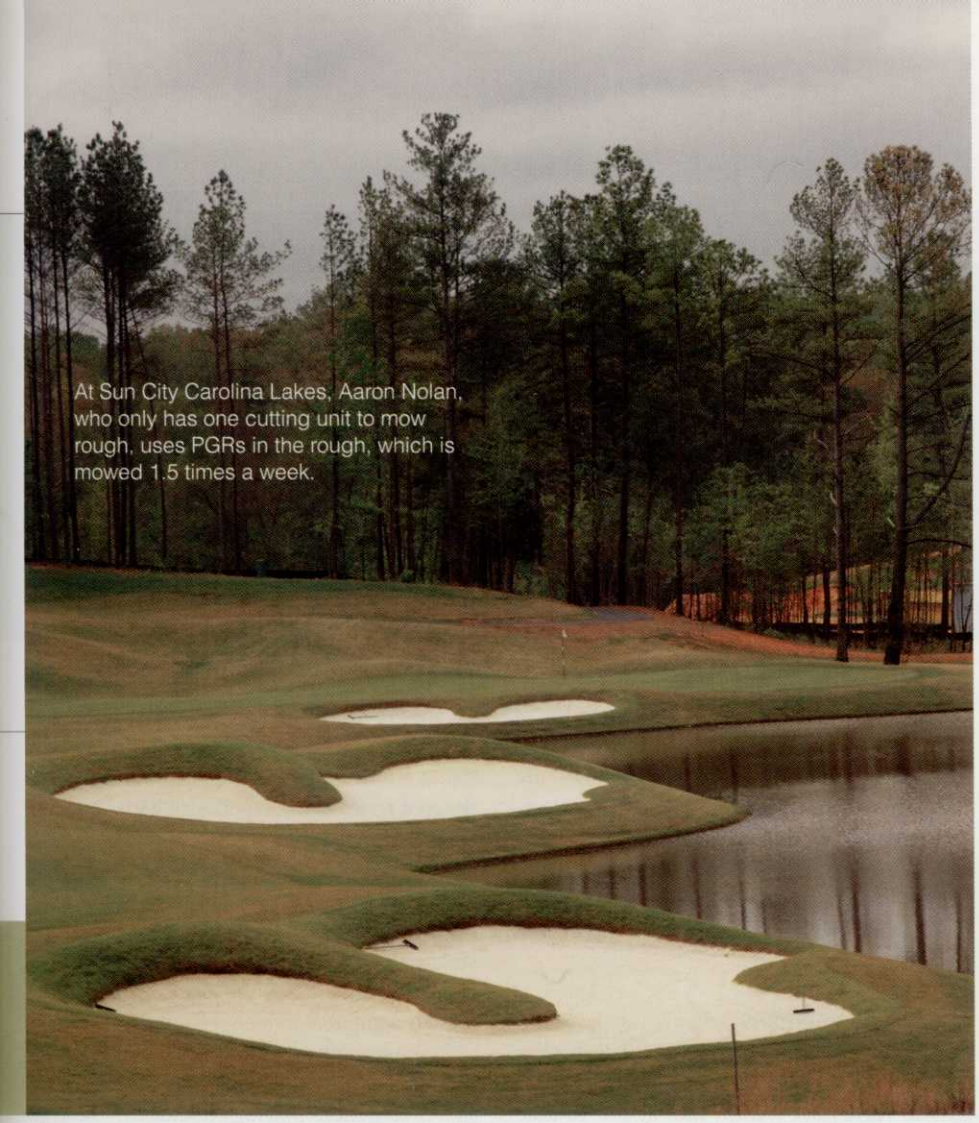
Plant growth regulators have been a veritable multitool for golf course superintendents for many years. Growth-inhibiting PGRs generally are used to control growth of warm- and cool-season grasses and for seed head suppression, primarily with *Poa annua*.

But, more recently, this type of PGR has been used to manage turf stress, especially under drought and shade conditions. Superintendents also use these products to enhance overall turf quality, promote a smooth and uniform playing surface and improve stress tolerance in intensely maintained areas.

CREATIVE USES

While growth reduction generally is the goal of plant growth regulators, a number of other creative uses have been developed, says Nick Christians, Ph.D., a professor in the horticulture department at Iowa State University.

"*Poa annua* control remains a serious problem for golf course superintendents around the world," he says. "One of the creative uses of PGRs has been to use them as part of a carefully structured integrated program to reduce *Poa annua* in golf turf. Giberallic acid-inhibiting (Type II) material doesn't kill the *Poa*, but slows its growth more than bentgrass. Over time, this results in an advantage to the bentgrass. Success depends on the skill of superintendents in adapting the program to their particular situation."



At Sun City Carolina Lakes, Aaron Nolan, who only has one cutting unit to mow rough, uses PGRs in the rough, which is mowed 1.5 times a week.

Color enhancement is another benefit of PGRs, especially with giberallic acid-inhibitor materials.

"This is particularly true with trinexapac-ethyl (Primo), which often results in a darker green color of treated turf," Christians says. "As is usually the case, this response can be highly variable."

PGRs have been used as a tool to improve the overseeding of cool-season grasses into warm-season turf. The goal is to slow the growth of the warm-season grass without inhibiting the establishment of cool-season grass seedlings. With this practice, timing is critical.

"Primo tends to be one of the best PGRs for this purpose because of its foliar absorption and its reduced likelihood of inhibiting the cool-season germination," Christians says.

A critical factor when using this product is that it must be allowed to dry on the Bermudagrass tissue before overseeding takes place.

In northern regions, freeze damage can be a serious problem.

"PGRs slow growth, thicken cell sap and might provide an antifreeze-like effect," Christians says. "A study a few years ago observed enhanced freeze tolerance of annual bluegrass treated with low rates of trinexapac-ethyl. Northern superintendents who often experience *Poa annua* loss during winter might want to experiment with this idea."

One of the factors that limits fungicide efficacy is plant growth, or when the plant contacts are mowed off soon after application. PGRs tank-mixed with fungicides show promise in extending efficacy and reducing fungicide rates needed for disease control. Some PGRs might even directly suppress dollar spot on treated turf.

"Research has shown PGRs can improve shade tolerance of certain species, particularly zoysiagrass," Christians says. "Trinexapac-ethyl has been shown to reduce clippings, prevent scalping, and might improve establishment of new sod and stimulate tillering of Kentucky bluegrass being grown for sod."

SAVE TIME

Labor savings is another reason why David Smith, superintendent of golf and grounds at Abbey Springs in Fontana, Wis., uses plant growth regulators. The 18-hole resort course has a maintenance staff of nine during the peak season.

"WITH THE SIZE OF MY STAFF, I'LL LOOK AT ANYTHING I CAN TO SAVE LABOR."

David Smith, superintendent of golf and grounds at Abbey Springs (pictured)

"We have used Primo very effectively for many years and have reduced our tee mowing by 33 percent," Smith says. "I haven't calculated a dollar figure because we use the time saved to enhance other aspects of the course. And, Primo is effective for five to six weeks after application. On greens, we use it as a stress conditioner."

Smith also uses Proxy to reduce the time spent weed-eating banks and other areas that are difficult to mow. He applies the product to the bluegrass, and it's effective for five to six weeks.

"With the size of my staff, I'll look at anything I can to save labor," he says. "I started using PGRs more than 20 years ago with the original formulation of Embark. Throughout the years, these products have helped me a lot and have been a big time-saver."

CONSISTENT GREEN SPEEDS

At Park Hills Golf Course in Freeport, Ill., the target green speed is 9.5 feet. Superintendent David Fisher uses a combination of PGRs on the 36-hole public facility's Penncross creeping bentgrass greens. The first two applications in spring are a mixture of Primo and Proxy to control varying percentages of *Poa annua* in greens that are 52 and 25 years old. In late spring, Fisher switches to using strictly Primo. In the summer, it's a mixture of Primo and Cutless. Then it's back to straight Primo during the fall. Applications are at two-week intervals.

"This program allows us to have a little higher height-of-cut and still maintain the green speed we want," Fisher says. "We use triplex mowers and generally cut at 0.11 inch. The PGRs control growth and let us maintain our desired green speed a little longer throughout the day."

Fisher has a program for fairways, but it's only implemented in the spring. Between April 15 and May 15, Fisher applies a combination of Primo and Proxy. Fairways – a mixture of Kentucky bluegrass, ryegrass and *Poa annua* – are cut at three-quarter inch.

"We do this strictly for seedhead control," he says. "In the spring, there's a surge of growth, and it can be messy in the fairways after we cut them. PGRs regulate the growth and make clippings more manageable."

CONSISTENT CONDITIONS

Aaron Nolan, superintendent of Sun City Carolina Lakes in Lancaster, S.C., applies plant growth regulators wall-to-wall at the 18-hole public course. Primo is used extensively in July and August during the heaviest growing period for 419 Bermudagrass.

"At this property, growth regulators relieve mowing stress and give us a consistent height-of-cut," he says. "But our biggest goal is consistent playing conditions. We don't mow fairways every day, and without PGRs, the grass tends to get a little shaggy during the nonmowing days."

The story is a bit different for the roughs. Because Nolan only has one cutting unit for the rough, it's mowed 1.5 times a week as opposed to the two or three times he would prefer.

"This is a large property, and we want to provide a consistent height-of-cut," he says. "I refer to growth regulators as 'liquid labor.' We don't have a large staff, but we're expected to deliver top conditions. These products help us achieve that."

Again, the rationale for PGRs on greens is different. The primarily G-2 bentgrass surface is mowed daily, and it's necessary to maintain consistent green speeds of 9.5 to 10 feet throughout the day.

"On greens, we use a combination of Primo and Cutless," Nolan says. "The Primo absorbs on top as a foliar product, while Cutless works in the root zone. In my experience with bentgrass greens, if there's a 30-percent population of *Poa annua*, this combination works best to suppress *Poa* seedheads. When we aerify in spring and fall, I use Trimmit, which again is effective for *Poa annua* suppression or removal."

So how does Nolan sell the extensive use of growth regulators to management?

"Taking a big-picture view, how important is this relatively modest expenditure when the goal is consistent playing conditions?" he says. "Through the use of PGRs, we've increased our consistency by 20 percent, and that speaks for itself." **GCI**

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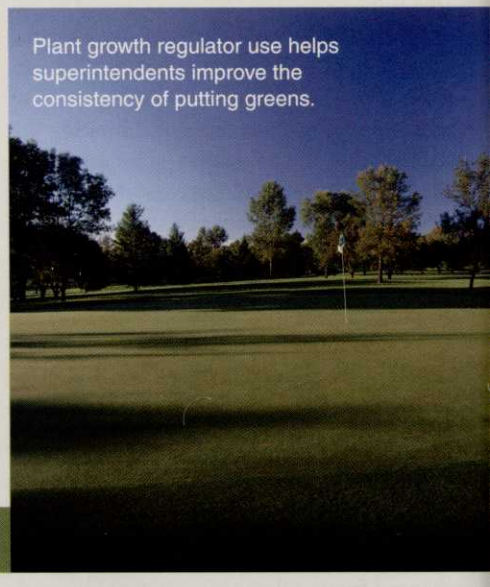

Plant growth regulator use helps superintendents improve the consistency of putting greens.

Turn to pages 76 and 78 to read about how two superintendents purchase and use plant growth regulators.