



With so many factors out of their control – weather and amount of play, to name a couple – superintendents are looking at plant growth regulators to take charge of their turf.

According to Laurence Mudge Manager of Bayer's Green Solutions Team, plant growth regulators – or PGRs, as they're commonly referred to – are simply an organic compound, natural or synthetic, which when present or applied in small amounts, alter plant growth and development.

"PGRs are tools that can help golf course superintendents manipulate plant growth to maximize desirable turf characteristics and playing conditions," Mudge says. "Some of the desired changes in turf growth and development would include: growth reduction, increased density, recuperative potential, fewer clippings, decreased mowing, deeper roots, increased

green speed, fewer seedheads and improved turf color.”

Mark Brotherton, SePRO Turf & Ornamental Product Manager, adds finer leaf texture, improved stress tolerance and *Poa annua* suppression, among other things, to reasons why plant growth regulators are popular.

“Consistent PGR applications made throughout the growing season help maintain a physiological balance in the plant, providing more predictable turf-grass growth and performance,” Brotherton says.

Sean Remington, superintendent at Green Valley Country Club in Lafayette Hill, Pa., is a PGR proponent. “The biggest benefit overall is the manageability of the grass and improved playability for golfers,” he says. “PGRs are one of the biggest im-

pacts on playability of the game of golf and maintenance in the last 20 years.

“In the 80s, if we had a stretch of 3-4 days of rain and couldn’t get on the course to mow, we had to raise the height of cut and really work to get it back to where it was. Now, 3-4 days of rain doesn’t scare you as much. You don’t have as far to come back from,” he adds. “It changed the whole game right there.”

PGRs are used as part of an integrated disease management program to directly and indirect-

Sean Remington, Green Valley Country Club

“PGRs are one of the biggest impacts on playability of the game of golf and maintenance in the last 20 years.”

ly suppress turf diseases, Mudge says. For example, PGRs like Primo Maxx and Trimmit have been shown in university trials to control dollar spot.

“Other PGRs positively affect the turf plant, which results in improved plant health and greater tolerance to summer stress diseases like anthracnose,” he says. “Annual bluegrass seed-head suppression with Proxy reduces the bumpiness on putting green surfaces, resulting in a truer ball roll, minimizes the presence of unsightly seedheads,

and improves long-term plant health by reducing the energy plants use when producing seed. Primo Maxx can suppress vegetative growth, reducing the need for frequent mowing, along with making plants more compact, increasing plant density, and resulting in better playing surfaces.

“Both of these PGRs have been shown to reduce the impact of anthracnose on annual bluegrass and creeping bentgrass,” Mudge adds. “Simply put, suppressing seedheads allows the plants to use more energy on vegetative



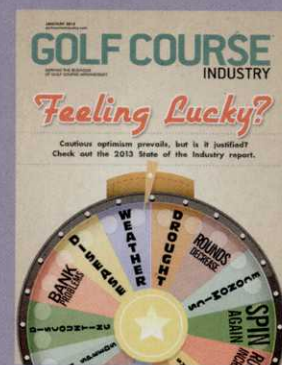
SUPERthrive®
The Original Vitamin Solution

Many golf courses apply **SUPERthrive®** on Mondays to revive weekend-stressed turf

SUPERthrive
WORLD'S FAIR
1940 Gold Medal
The Original Vitamin Solution

Vitamin Institute ~ 12610 Saticoy St. South, N. Hollywood, CA 91605 ~ 800.441.8482
See our Free Trial offer at www.SUPERthrive.com

Were You Featured In This Issue?



Reprints enable you to reuse your article and simply place it into the hands of your target audience. Having been featured in a well-respected publication adds the credibility of a third-party endorsement to your message.

Give yourself a competitive advantage with reprints.

800-456-0707
reprints@gie.net

growth, and vegetative growth reduction provides adequate turf quality without resorting to negative practices like ultra-low mowing heights or sub-optimal nitrogen fertility."

PGRs are applied as part of a superintendent's normal agronomic program, most often as part of a foliar spray program. The equal distribution and uptake by plants is critical in achieving uniform results, thus foliar sprays are generally recommended over granular applications, Mudge says.

The "best time" to apply is a moving target.

"It depends on the PGR used and the desired effect," Mudge says. "Seedhead suppression with Proxy should be performed prior to seedhead formation; for plants like annual bluegrass or creeping

bentgrass, it would be in late winter through spring, as cool-season turf begins to grow very actively. Many superintendents use growing-degree-day models from Michigan State University and Virginia Tech University to assist with proper timing.

"For warm-season turf such as Bermudagrass, seedheads can be suppressed during spring transition from dormancy," he added. "Growth-reducing PGRs can be used throughout the year on actively growing plants, but superintendents should be careful not to over-regulate growth during periods of stress or when growth is reduced by excess heat or cold temperatures."

Cale Bigelow, Ph. D., associate professor, agronomy – turfgrass science at Purdue University, admits nobody really knows what

is best when it comes to utilizing PGRs during periods of stress, and solid arguments can be made on both sides.

"My bias is that less mower injury is probably better for the turf during late-summer stress," he says. "In recovery mode you are lightly feeding soluble nutrients and these, in turn, hopefully are pushing growth."

If turf is still under regulation, Bigelow says superintendents can alternate daily mowing and lightweight rolling for surface smoothness. Because of the potential of rapid regrowth as the PGR wears off, he generally recommends staying the course for a few more applications until summer temperatures moderate, thinking the benefits outweigh the potential risk.

Brotherton noted that applica-

tion frequency is driven by type of playing surface it is applied to.

"Putting green applications are made as often as weekly and spread out to as long as monthly," he says. "The most common frequency is every 1-2 weeks. Tee and fairway applications are made every 2-6 weeks, with 3-4 weeks being the most common. Turf maintained at a high mowing height would require less-frequent applications."

As for speed of activity, Brotherton says foliarly absorbed PGRs begin regulating within 1-2 days, while root-absorbed products begin working within 2-4 days. The speed at which a PGR can be absorbed and translocated through the plant depends on several environmental factors as well as how physiologically active it is.

Inject-O-Meter Injection Pumps

THE CHEMICAL INJECTION LEADERS FOR OVER 40 YEARS!

OUTPUTS: .20 TO 327 GPH



Our Fertigation pumps have proven themselves time and time again on golf courses, sod farms, greenhouses and thousands of crops around the world. There are more expensive systems out there, but if you want a simple, reliable, bullet proof Fertigation System that works, call Inject-O-Meter today!

1-800-545-4440

Email: rthorn@inject-o-meter.com

Website: www.inject-o-meter.com



Bird Phazer Laser
for Canada geese



5 3/4" X 1 1/8"

During a recent USGA Turf Advisory Service visit, a laser was used to show how Canada geese can be removed from the course.

The pocket-sized Bird Phazer Laser emits a powerful bright green light. When the beam hits the feathers of geese, it makes a bright splash of light. Their eyes are very sensitive to uv light, and the bright green laser light is very traumatic for them. A flock of more than 50 Canada geese immediately took flight from more than 200 yards away.

\$199 Compare to the
Avian Dissuader

geesedamage.com
(800) 555-9634
JWB Marketing Columbia, SC

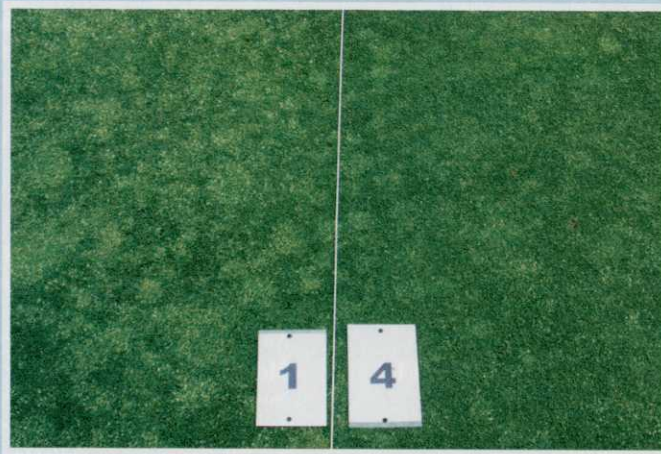
TURF MANAGEMENT

Frequency depends on the PGR used, Mudge says.

“Seedhead suppressors like Proxy and some others are typically applied 1-3 times in the winter-spring transition period during seedhead formation,” he says. “Other growth-regulating PGRs can be applied monthly to weekly during the growing season. Typically, the more frequently these are applied, the lower the use rate to provide even, uniform plant growth regulation. Using high rates infrequently can result in more variable results.

We know the benefits, but what are the dangers?

“There is always the risk of over-regulation,” Brotherton says. “Over-accelerating growth could cause the plant to literally grow itself to death, while over-retarding growth could lead to



Poa seedhead suppression reduces bumpiness on greens.

turfgrass injury or decline.”

Mudge stressed caution.

“PGRs affect plant growth, so superintendents should be careful when using them on weakened or stressed turf. PGRs work best on turf that is healthy

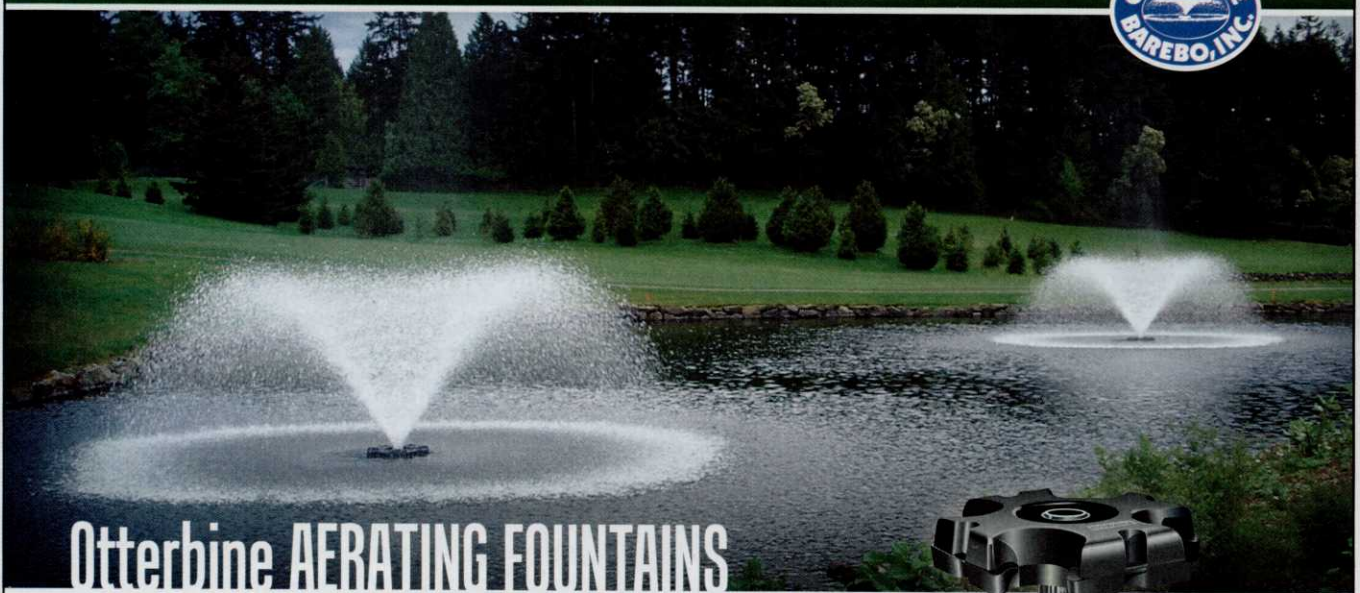
and maintained with strong agronomic and IPM practices,” he says. “I like to use the analogy that ‘even the best medicine won’t help a starving patient.’ When used improperly, PGRs can weaken or damage turfgrass.

“In addition, caution should be taken when using PGRs in conjunction with DMI (demethylation inhibitor) fungicides, which are very similar chemically, especially during high temperatures,” he adds. “If you tank-mix the two, or even apply a DMI fungicide on PGR-treated turf, you run the risk of over-regulating the turf, which can result in phytotoxicity. To reduce the risk of any issues, avoid applying to stressed turf or during high temperatures.”

Jerry Corbett, technical service manager at Quali-Pro, warns that where you start in terms of turf health will have a lot to do with where you finish.

“The dangers would be jumping into a PGR program with a weak turfgrass base to begin with,” Corbett says. “Promote the

You Don't Have to Be Green to be Clean...



Otterbine AERATING FOUNTAINS

OFFERING BOTH FUNCTION AND BEAUTY these surface spray aerators are engineered to provide results, and are supported by a 5-year warranty and *Pattern Guarantee*. Widely used throughout the world, Otterbine's Aerating Fountains improve and maintain water quality in ponds and lakes by controlling algae and eliminating odors while providing attractive fountain-like displays.

To learn more call us at 1-800-237-8837 or visit us online at www.otterbine.com/aerating_fountains



Booth 4216

Aerating Fountains
by Otterbine®



TURF MANAGEMENT

turf health with proper nutrients, fertility, water and oxygen first. Even though all superintendents want to save money and reduce mowing, don't over apply. And give the plants some time during the year to develop roots, like early fall or mid spring."

FUTURE. There aren't a lot of new compounds being introduced, Bigelow says. Instead, researchers are "playing around" with ways to use what's on the market. One of his objectives is helping turf tolerate summer stress – heat, humidity and dry conditions.

Brotherton sees a bright future for the use of plant growth regulators.

"As we continue to conduct more research, we are able to better understand how they work amongst the many scenarios and

settings in which they are used," he says. "Our research continues to lead us down a path where we are constantly developing new PGR products and unique applications for them."

Companies continue to conduct research to bring new, novel compounds to the market, Mudge says. In lieu of new products, companies are now selling premix combinations of two or three existing PGRs.

"As for the future, PGRs will continue to be an integral part of golf course management programs," Mudge adds. "PGRs are being used more and more for resource management and turf quality benefits. Golf course superintendents are very innovative [and] will continue to identify new uses for PGRs that allow them to do their job more

efficiently and provide quality playing surfaces."

ADVICE. "Low and slow, that is the tempo," Mudge says about introducing PGRs to a maintenance program. "Don't rush into using a new product because the wrong product, rate or timing can result in setting the turfgrass back during a critical growth period. It is better to use lower label rates and more frequent applications than high-rate applications until you are comfortable with how your turfgrass reacts to a new PGR.

"Since plant growth is affected by the environment and agronomic practices, adding a new PGR into the program may require some additional fine-tuning," he adds. "Review research findings from different universities and regions, and try a

few test areas or some small-scale applications before applying a new product across the entire golf course."

Corbett agrees with the university approach, but also urges additional research on the PGR, as well as the company from which you purchase the PGR.

"Never use a product without looking at the data to see how it performed in university research," he says. "Purchase products from manufacturers that support the industry and not from a company that you haven't seen before or don't know anything about. That way you will have someone to call on for support in the event there is an issue." **GCI**

Rob Thomas is a Cleveland-based freelance writer and a frequent GCI contributor.

SOME PENNINGTON WATER STAR[®] QUALIFIED CULTIVARS WILL REQUIRE UP TO 50% LESS WATER YEAR AFTER YEAR.

Water Star is an internal designation by Pennington Seed for grasses that use significantly less water based on external, independent testing performed by the Turfgrass Water Conservation Alliance[®] (TWCA) and universities.

WATER STAR CULTIVAR



ORDINARY SEED



AFTER 27 DAYS WITH NO WATER APPLIED

WWW.WATERSTARQUALIFIED.COM

ALL CONTENT © 2012 PENNINGTON SEED INCORPORATED. ALL RIGHTS RESERVED.

Water Star
QUALIFIED GRASS SEED

PENNINGTON
THE GRASS SEED PEOPLE