

# The Price of *Progress*

Now that plant growth regulators have evolved into an integral turf-maintenance tool, the next step for manufacturers is to lower their cost

It's amazing how times have changed for plant growth regulators since their introduction to the turf market in the 1950s. Superintendents avoided them because of their reputation for doing damage to, rather than helping, their turf. Now they find it hard to live without them.

As successful as PGRs have become, manufacturers complain that the market has flattened. Superintendents want to use the chemicals to produce the highest quality turf, but some superintendents find themselves deciding between a PGR or an extra fertilizer application. More often than not, the PGR loses the battle because superintendents view fertilization as a more vital use of their limited financial resources.

Manufacturers find themselves in a bind. They've spent millions of dollars to develop the PGRs, so they have to charge prices designed to recoup their investments. At the same time, high prices inevitably shrink their market.

So despite PGRs benefits, the market won't grow beyond today's numbers until chemical companies develop cheaper versions of today's chemicals, says Russ

Mitchell, technical director and agronomist for United Horticultural Supply. When the patents on the current chemistries expire, superintendents will see their prices plunge. For the end-user, however, the development won't occur for many years, he adds.

"It's a difficult decision for some superintendents," Mitchell says. "They know they need PGRs to grow the best turf, but when there's a budget crunch, it's always the first chemical to get cut. The market needs a lower-priced brand."

Given the long road PGRs have taken to achieve the status they have today, it's hard to bet against innovations in the market that could bring down prices and improve the products' efficacy. After all, chemical companies never intended plant growth regulators for use on high-quality turf.

## They've come a long way

When the first PGRs entered the market, companies expected suburban homeowners to apply PGRs to their home lawns, according to Bruce Branham, associate professor of turfgrass at the University of Illinois.

Turning those expectations upside down, PGR use by homeowners is practically non-existent while use by superintendents has exploded.

At first, superintendents refused to use the products because their mode of action — inhibiting cell division — often caused unsightly yellowing. The slowing of cell production also weakened the turf, leaving it more susceptible to disease pathogens.

"Back then, it was a niche market, designed for out-of-play areas on the golf course and roadside turf control," says Joe DiPaola, golf market manager for Syngenta Professional Products, the current producer of Primo.

In the 1980s and 1990s, however, more research produced different modes of action. Instead of slowing cell growth, the new products targeted a plant hormone called gibberellic acid (GA), DiPaola says. If you slow production of GA in turf, you inhibit its growth without the damage caused by previous products. Now, DiPaola says most superintendents count PGRs as part of their regular maintenance programs.

## PGRs Through the Ages

Decade	Mode of Action	Point of Entry	Examples
1950s - 1980s	mitotic inhibitors	foliar or root	maleic hydrazide, mefluidide
1980s	early gibberellic acid synthesis	root	paclobutrazol, flurprimidol
	phytotoxic responses	foliar and/or root	sulfometuron-methyl, chlorsulfuron, ethofumesate
1990s	late gibberellic acid synthesis	foliar and crown	trinexapac-ethyl
	plant hormone generator	foliar	ethephon

SOURCE: SYNGENTA PROFESSIONAL PRODUCTS

### Ancillary benefits

Once superintendents started using PGRs on an array of turf, ancillary benefits emerged. Superintendents slowly recognized that PGRs didn't just slow growth. They also reported that overall turf quality improved significantly with repeated use of PGRs

Slower growth allows turf to put down deeper root systems, which produces denser turf, Mitchell says. Deeper roots allow plants to resist disease more effectively, show more consistent color and weather stressful conditions better.

In 1999, superintendents started using PGRs on greens for the first time. It gave them a new weapon in the ongoing battle with *Poa annua*. In fact, Branham says companies pushed *Poa annua* seedhead suppression as one of the primary add-on benefits of PGR use.

"There are certain products on the market that do keep *Poa annua* seedheads in check," Branham says. "Superintendents still have to do their research before putting a specific PGR on their turf, however, because not all PGRs handle suppression equally well."

In addition to suppressing the seedheads, Raymond says PGRs can also help "smooth out" putting greens. If a green has a rye/*Poa* mixture, for example, judicious use of PGRs can help them grow at the same rate.

"I've had superintendents tell me that the use of PGRs has promoted uniform greens to the point where you can't tell the difference between different varieties of grass," Raymond says. "If the superintendents can't see the difference, you can bet the golfers can't either."

### Prospects for the future

Insiders agree that if manufacturers want to expand the market significantly, they should focus on producing inexpensive products. The expense of research and development, however, discourages companies from making the investment, Mitchell says.

"Since current PGRs work well, most companies are moving on to areas like fungicides, where there's greater potential

for revenue growth," Mitchell says. "I wouldn't spend a lot of time waiting for the next great growth regulator."

Even competitors acknowledge that Syngenta's Primo leads the market. That's because Syngenta has marketed the additional benefits of PGRs most effectively, says Mike Bandy, marketing manager for professional control products for The Andersons, which manufactures Primo competitor TGR. That doesn't mean the other producers should close up shop, however.

"The effectiveness of products, including Primo, depends largely on where you are in the country and what grasses you have," Bandy says. "As long as there are regional differences, there will be a demand for various products in the market."

In addition, the quest for new applications for the older technology won't stop just because the market is flat. Raymond says superintendents will drive the research with their observations, as they did with the dis-

covery of enhanced turf quality after PGR use.

"Superintendents are clever in the way they notice subtle changes on the course," Raymond says. "PGRs never would have grown in popularity if superintendents hadn't noticed a significant increase in quality and passed along that news to their neighbors."

The University of Illinois' Branham believes that, eventually, nearly all golf courses will use either new chemistries (or revisions of older ones) with lower rates and longer efficacies to manage turf.

"Even if we only fine-tune the existing chemistries, they will give superintendents an unprecedented level of control over how and where their turf grows," Branham says. "We may eventually be able to grow grass where we want it and when we want it. That will largely be because of PGRs." ■

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