

Double-Edged Sword

Growth regulators can conceivably help *Poa annua* get through the summer while reducing its spread by seed.

By Jeff Hagman

"From the golfer's standpoint, *Poa annua* is like the girl with the curl in her hair," says Dr. Thomas Watschke, professor of turfgrass science at Pennsylvania State University. "When its right, *Poa* is beautiful—it can be mowed close. And because of its density and uniformity, it makes a great fairway surface.

"But when it's wrong, *Poa* can be awful. Golf course superintendents are faced with turf that doesn't mow well, because it produces stiff seedheads which are tracked everywhere to cause sanitation problems, turning fairways a pale oyster-white or yellow rather than green."

Now the development of plant growth regulators (PGRs) by

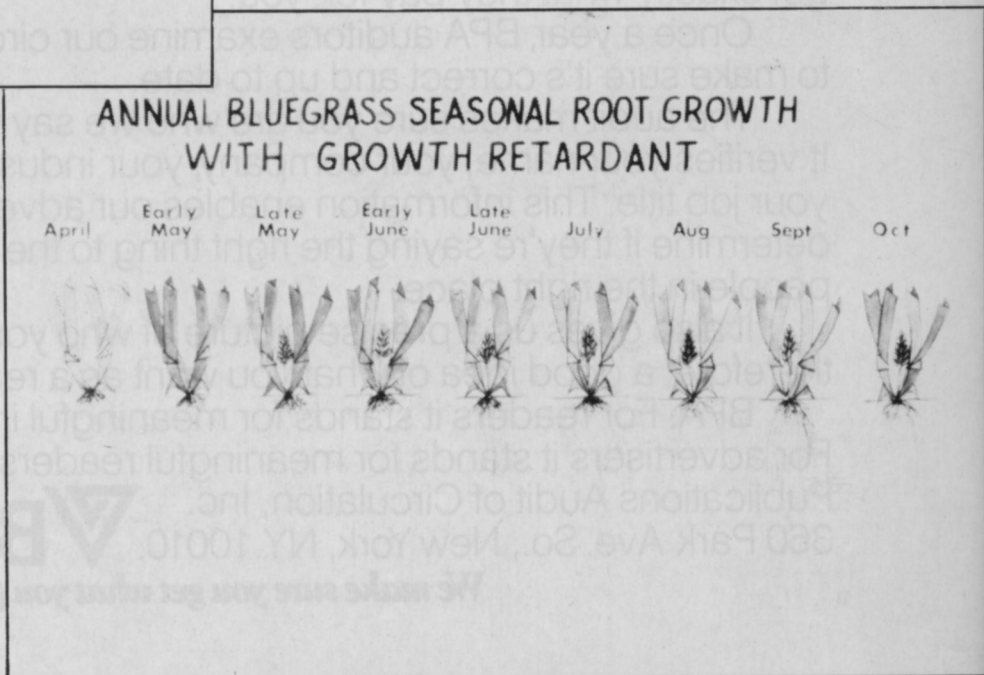
firms like 3M and Eli Lilly Company threatens to end that love-hate relationship between golf course managers and the light green, shallow-rooted *Poa annua* that populates an estimated 90 percent of American golf course fairways.

In the mid-1960's, the increase of automatic irrigation systems and the EPA and OSHA restrictions on lead and calcium arsenates combined to establish *Poa annua* as—in the words of Purdue University agronomist Dr. Ray Freeborg—"a turfgrass by default."

"Before the development of PGRs," explains Watschke, a member of the GCSAA Educational Advisory Committee, "the battle lines were simply drawn. Some golf superintendents said, 'I'll accept *Poa annua*, buy an automatic irrigation system, and get more money for my fungicide budget.' Or superintend-



Seedhead production is at the expense of root development in *Poa annua*. Growth regulators can reduce the bad characteristics of *Poa* and reduce mowing frequency.



ents could treat *Poa* as a weed, saying, "Kill it with calcium arsenate and overseed with competitive species."

But PGRs offer what Watschke calls "a double-edged sword," a philosophic and agronomic alternative to pre-emergent root inhibitors like Betasan (Bensulide), DCPA (Dacthal), Benefin, or total soil sterilants like methyl bromide.

"With the new PGRs," says Watschke, "you can improve *Poa annua*'s ability to survive. But timed differently, PGRs can be used to help convert a stand of *Poa* to other species." For the last three years, research into the PGR's potential to both promote *Poa annua* root growth and suppress seedhead production has accelerated at universities like Michigan State, Pennsylvania State and Purdue, as well as at golf courses in Ohio, Indiana and New Jersey. If the PGRs succeed in avoiding *Poa annua* brown-out during times of heat or moisture stress, the products could turn what Purdue researchers condemn as "failure grass" into an example of what Dr. Watschke calls "a hot issue—the manipulation of plant growth as a management tool for our advantage."

Most promising for golf course applications is the PGR's ability to shift the utilization of photosynthate stored in *Poa annua* away from seedhead production. Instead, the photosynthate is used or stored in parts of the plant where it could conceivably make it more stress tolerant in the summer. "When golfers end up with their golfballs lying in a bunch of seedheads," says Watschke, "it doesn't offer them a proper shot. In addition, many people have tremendous allergy problems with seedhead-filled *Poa*. I've seen black golf shoes end up yellow. When you're talking 160 seeds produced by one plant, that's a significant pollen load.

"Golf course superintendents can't do much about a plant's metabolic potential. But once it gets its metabolic act together, we can shut

Jeff Hagman is a marketing supervisor for 3M, Agricultural and Commercial Products Division, St. Paul, MN.

it down. And then, with deeper root growth, the *Poa annua* proceeds through the summer stress season morphologically better suited to handle it because of its improved top-to-root ratio."

In late-March, 1983, 3M received EPA approval for use of Embark PGR for *Poa annua* seedhead suppression on fairways using a 1/2-pint per acre rate. Introduced in 1978 for public works and highway maintenance mowing reduction, Embark (mefluidide) has been tested by Michigan State University turf pathologist Dr. Joe Vargas, Watschke, and Freeborg.

One example of PGRs utility in converting a course from *Poa annua* to a competing species like creeping bentgrass is the work of Frank Dobie, 18-year veteran general manager and superintendent for Sharon Center, Ohio's Sharon Golf Club. Dobie currently uses EMBARK PGR across 22 acres of *Poa annua* on the fairways of his 18-hole course. Over the last 14 years, the Sharon Club's turf has evolved from a predominantly Merion blue-grass stand in 1966 to

"If we get 50 percent Penneagle here in five years, I'll be thrilled."
Dobie.

one with almost 90% *Poa annua* by 1980. Dobie is determined to use the PGR as part of his five-year conversion program to Penneagle creeping bent. But Dobie is realistic. "If we get 50 percent Penneagle here in five years, I'll be thrilled to death."

Beginning in the Spring of 1981, Dobie sprayed PGR at the recommended rate of a quarter-pound active per acre on all 22-acres of his fairway using a 300-gallon boom sprayer. He followed that with an overseeding of Penneagle creeping bent. Dobie applied the PGR slightly after greenup, keeping the material off the roughs to avoid retardation of the bluegrass there. "The result," claims Dobie, "was very good. The PGR did inhibit *Poa annua* growth on the fairways. By the end of May 1981, the

two-weeks of discoloration had ended. The Penneagle was up into the two-leaf stage and by June 1, the fairways looked gorgeous in color and texture. *Poa* still predominates, but we now have more than 5-10 percent bentgrass."

"And the PGR eliminated *Poa annua* seedhead production for us by 90%," concludes Dobie, who predicts that a variety of cultural strategies will contribute to a doubling of his present bentgrass population to 10-20%. Dobie has instituted extensive aerification of his fairways from November to December with a Dedoes aerifier to expose the soil, pick-up the grass clippings to promote the spread of bentgrass, and planting of divots on the fairways with a soil and bentgrass seed mixture on a daily basis.

At Rivervale, New Jersey's 27-hole Edgewood Country Club, golf course superintendent Bill Gaydosh has experimented with PGRs for four years to convert his turf from *Poa annua* to bentgrass. "We've now got 60 percent bent in the fairways," says Gaydosh. "If we can reduce the seedheads from *Poa annua*, it'll be worth it for the aesthetic value alone."

When Gaydosh joined the Edgewood Country Club in 1975, the fairways were populated with almost 100 percent *Poa annua*. Gaydosh initiated an overseeding program with Seaside and Emerald creeping bent. "The *Poa* didn't hold up during the summer unless you used extensive maintenance practices like syringing, aerifying, and disease control."

Gaydosh initiated test plots of PGR in mid-November 1979, using a 16-ounce per acre rate on a single acre of fairway at Edgewood. "The results," Gaydosh remembers ruefully, "were drastic and yellowing, with a reduction of seedheads in the spring and dead *Poa* during the winter." But by 1981, Gaydosh was timing his trial of the eight ounce per acre rate in the spring, "right after green-up." He found the results "very encouraging—with little discoloration and almost no seedheads."

This year, Gaydosh is treating 10 acres of Edgewood fairway with

continued on page 54

the eight-ounce rate. "If it works as well as we expect," says Gaydosh, a graduate of the Rutgers turf program, "I expect to spray all 50 acres of fairway and 3 acres of tees with the PGR next year. We try to spray in the morning, when the dew is on the turf, using a 100-gallon John Bean sprayer and a

"Sprayers can be off by 25 to 50 percent. You need accuracy with PGRs." Morris.

Cushman cart. And the timing—just after green-up—is critical."

"The window which golf course superintendents are dealing with here," agrees Tom Watschke, "is the time between green-up and seed emergence. That can be as little as two to five days. I'd suggest golf course superintendents become hands and knees diagnosticians, peeling back the sheath to witness the seedhead still in the

boot. If you apply the PGR, you'll keep that seedhead inside."

With the *Poa* species so sensitive to temperature, the advisability of using a PGR may vary depending on the geographic location of a course. "In New York, Pennsylvania and Northern Ohio," says superintendent John Morris of Highland Golf and Country Club, "you get by fine with *Poa annua*. If I was a superintendent in Minnesota, I'd try to grow *Poa*. But here in Indianapolis, we have such a problem getting through the summer heat stress." As a result, Morris began experimenting with PGRs in the Spring of 1982 on six 1,000-meter plots. The Highland fairways currently support a 50% *Poa* population, and Morris is overseeding with Penncross bent. "That Fall 1982," says Morris, "we sprayed two EMBARK applications mixed with another growth retardant. And it burnt the living tar out of it. But we used a rate much higher than the recommended half-pint per acre rate." This year, Morris is returning with the PGR on a 1000-square-foot plot.

"The first thing a golf course superintendent should do," warns Tom Watschke, "is gain experience with a PGR. Don't use it immediately on all fairways. Use test plots, perhaps a practice fairway, to anticipate the response of your turf. And take areas which will give you the most information. Try a place with lots of developing seedheads in the *Poa* or turf that gives you the most problem in the summer with *Poa* loss due to drought."

Adds Norm Axe, head of the chemicals and fertilizer division of Detroit's Lawn Equipment Company: "We recommend golf course superintendents recalibrate their spray equipment so they know what they're putting down. You've got some latitude in spraying dandelions. But you need accuracy with a PGR. Some sprayers can be off by as much as 25 to 50 percent."

"Nothing will tell on you like a PGR," agrees Watschke. "Many golf course superintendents will say its the first time they could get a handle on how precisely their spray operations perform."

"Put your best spray applicators

on the job," says Sharon's Frank Dobie. "We use white foam markers to avoid overlapping. Because where ground crews skip or overlap, or where spray nozzles are plugged up, that will be evident."

Prices for commercially-available PGRs vary; 3M's EMBARK averages \$140 per gallon. Edgewood's Bill Gaydosh calls that, "a little expensive for me to

"Research continues on the effects of PGRs on seedhead production and *Poa annua* control.

use, but worth it. My PGR costs per acre is \$9.00.

"There's definitely money to be saved with the use of PGRs," says Watschke. "Properly timed, a golf course manager trying to improve the quality of the *Poa annua* will find the plant has less disease and hence you apply less fungicide. It's also more drought-resistant so you can reduce your irrigation requirements, and causes less wear on mowing equipment due to seedheads. And the PGRs harbor an additional benefit. "Our May mowings dropped from the usual 14 times to five times," says Dobie.

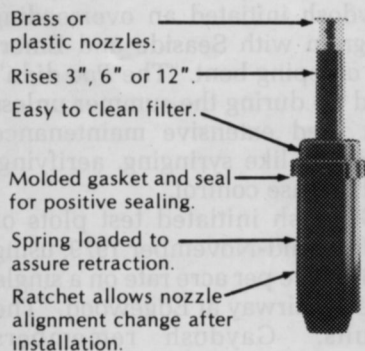
Research continues on the effects of PGRs on seedhead production and *Poa annua* control. The Eli Lilly Company has an experimental permit for Cutless (EL-500) a growth regulator featuring minimal discoloration.

Yet most critical PGR research may still spring from testing by golf course superintendents. Both Meridian Hills in Indianapolis and the Crooked Stick Golf Club in Carmel, Indiana, are experimenting with a variety of PGRs for use in converting fairways from 50% *Poa annua* to bentgrass.

University turf researcher Watschke welcomes that hands-on evaluation. "The more we can encourage golf course superintendents to carefully evaluate new products on their courses, the more widespread will be the acceptance of PGRs. That means improved playing conditions for golfers. "And then, I can retire." **WTT**

Whatever the Reason Whenever the Season

NEW! 3", 6" and 12" Plastic Pop-Ups for Grass, Ground Cover and Shrubs



Use in place of risers in turf areas. Out of sight, out of danger from human and mechanical damage. Install on present line.



Royal Coach/Buckner®

4381 N. Brawley, Fresno, CA 93711
(209) 275-0500 TWX 910 362 1167

Circle No. 138 on Reader Inquiry Card