

NEW CHEMISTRY ROLL CALL

What supers like, according to Green Section agronomists

By PETER BLAIS

United States Golf Association Green Section agronomists make thousands of annual visits to U.S. golf courses, putting them in a position to discuss with superintendents what new turf chemicals seem to be working and which need more work.

While forbidden from endorsing any specific item, a handful agreed to discuss products that are proving popular with golf course superintendents.

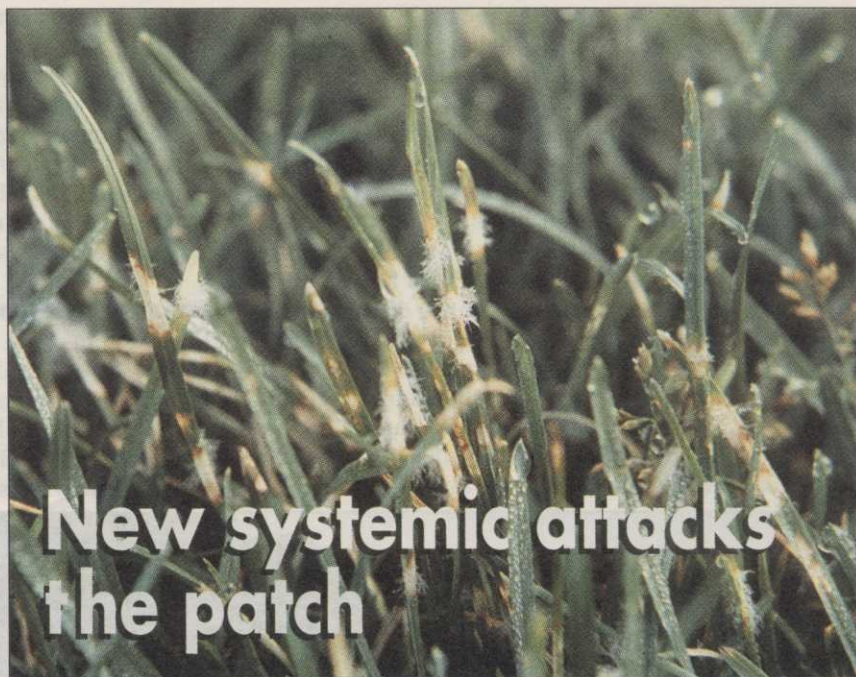
Bob Brame, director of the North Central Region, noted the acceptance of the plant-growth regulator Primo. Ciba introduced the product roughly a year ago. It differs from other Gibberellic Acid inhibitors in that it enters the GA production cycle later in the growth process, Brame said. Yet it still effectively inhibits grass cell elongation.

Brame also explained that, unlike other GA inhibitors, Primo application only affects existing turf. The foliar application becomes inactive after reaching the soil. That makes Primo effective for overseeding programs with new bentgrasses, slowing the growth of existing turf while giving the newly planted varieties a chance to take hold, he added.

While organics are not new, superintendents are revisiting natural materials like Milorganite and seaweed extracts as a way to reduce chemical dependence. "A lot of questions remain about their effectiveness," Brame said. "But they are often an important part of an overall turf management program."

Merit, a nicotine-based insecticide

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New systemic attacks the patch

Look for highs today in the mid- to upper-80s, with overnight lows in the 70s. There's a 95 percent chance we'll see some showers today and tomorrow, with the humidity level rising to a stifling 90 percent.

Conditions like these might be unpleasant for golfers, but weather forecasts are an even greater concern to superintendents. As the temperature and humidity begin to rise, the inevitable environmental conditions favoring turf diseases aren't far behind. This is the time of year when superintendents in many regions must decide how to prevent costly and damaging diseases from putting them on the hot seat.

One solution is a new systemic fungicide introduced to the turf market just last year. Cyproconazole, classified as a demethylation inhibitor (DMI), or sterol inhibitor (SI), has received good reviews in both trials and widespread use. Sandoz Agro is the only company manufacturing

cyproconazole. Other broad-spectrum systemics include Banner by Ciba, Bayleton by Bayer, Chipco 26019 by Rhone-Poulenc, Cleary 3336 by W.A. Cleary, Rubigan by DowElanco, and Tersan 1991 by Marshall Thomas.

Marketed under the name of Sentinel 40WG by Sandoz Agro, Inc., cyproconazole is designed to be effective at controlling a broad spectrum of diseases, including brown patch, dollar spot and summer patch: three of the most economically threatening diseases on turf.

Although the three diseases are caused by different pathogens, stimulated by different conditions and characterized by different symptoms, there is one common thread between them: They are all difficult to control.

While DMIs are some of the most commonly used fungicides, cyproconazole is the most systemic product available. "A comparatively small amount of cyproconazole can do the same job as competitive fungicides for

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IGR advances take center stage at Ottawa conference

By MARK LESLIE

OTTAWA — Citing little on the horizon in some areas of research but encouraging development of insect-growth regulators (IGR), bacterial toxins and natural fungi, Dr. Harry Niemczyk told Canadian superintendents here "the pot is boiling" to make Integrated Pest Management (IPM) stew.

Niemczyk, professor emeritus of entomology at Ohio State University, told the Canadian Golf Superintendents Association annual conference, "The amount of information and material you have to integrate as far as IPM is concerned is limited at best."

But, various types of preventive and curative measures are available and are being developed by forward-thinking companies and scientists.

Things that will determine what superintendents do and how they do it, Niemczyk said, are budget; course standards; governmental influence; and superintendent philosophy.

"What approach you take in this matter, these are the things that steer the ship," Niemczyk said.

Prevention should be the key to an IPM program, he said, adding that chemical, biological and cultural approaches should be integrated, based on some system of monitoring, observation and recording what's on the golf course.

Niemczyk presented a rundown on the outlook for pathogenic nematodes, bac-

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CIRCLE #133

Canadian supers get an earful on IGRs, bacterial toxins

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teria, fungi, viruses, protozoans, resistant varieties of turfgrasses, toxins, IGRs, and soaps and oils:

• IGRs: "A good deal of work is being done on insect growth regulators," which stop the insect's development and, more important, its feeding.

"They are low in toxicity because they affect specifically the enzyme and hormonal systems of the insect that tell it to continue in its development," he said. "Depending on the way the insect acquires it — if ingestion

is the way to accomplish its effectiveness — a lot of the good guys in turf that don't eat thatch or grass are not going to be affected. So, from a lesser toxicity standpoint, this group shows good promise for the future" and "can be used against a number of insects."

Niemczyk had high praise for Rohm & Haas' RHO345, a groundbreaking IGR that "affects the insect developmental mechanism in a way quite different from anything else. It is persistent. You put it on in the spring and it

stays there for a long period of time. I can put it on in May and it gives me billbug control ... in the summer and grub control after that."

"Chemistry-wise, the whole area of agents is wide open," he added. "Some totally different things are coming on line that I have never even dreamed of, or heard about."

• Bacterial toxins: The potential is encouraging, he said, especially for the U.S. firm Micogen's formulation of the *Bacillus Thuringiensis* (BT) bac-

'They have prepared a formulation of this BT toxin ... that actually went through thatch and gave us 85- to 90-percent control of grubs. That's the first time in 20 years I've been doing this that I have seen BT work against grubs. And other researchers found the same results.'

— Dr. Harry Niemczyk

terium for control of grubs.

"I was absolutely surprised [evaluating the product]," Niemczyk said. "They have prepared a formulation of this BT toxin ... that actually went through thatch and gave us 85-

to 90-percent control of grubs. That's the first time in 20 years I've been doing this that I have seen BT work against grubs. And other researchers found the same results."

BT produces a toxin that is extremely toxic to insects, but it is susceptible to ultraviolet rays, is not stable in soil and must be eaten by the insect to be effective.

"There are limitations on what BT can do, but there is a great deal of work going on in this field. One company has 10,000-plus strains of this bacterium," he said. "It would help us a bit with cutworms but it doesn't last long enough." So more research needs to be done.

Transgenic research has created new possibilities. The gene that tells the bacterium to produce the BT toxin can be extracted from the bacterial organism and implanted in a plant like corn which, in turn, produces that toxin.

Scientists at Michigan State University, Virginia Tech, Rutgers University and Ohio State are trying to inject that gene into a bentgrass plant so that it will produce its own toxin to help control pests like cutworms, Niemczyk said.

He also cited the promise of pathogenic nematodes, soaps and oils, and resistant varieties in growing healthy turf, but said much more research must be done in the fields of bacterial organisms (They exist "but I don't see a lot of new development along these lines because of our inability to produce them artificially."); fungi ("We just have to figure out a way to use it. I am encouraged that there are some major companies that have invested some real money on this."); viruses ("I can see nothing on the horizon for possible use of viruses on turfgrass"); or protozoans (Again, "I don't see any potential ... in a practical way.").

"These are some of the ingredients that are available or are in research that we can put in our IPM stew," Niemczyk said. "What you do and how you incorporate this concept on your golf course is going to have a lot to do with you as a superintendent, your course, plus the governmental agencies that are going to be telling us a whole lot more about what we can and can not do in the future..."

"Not any one of these things are going to solve all our problems. But who can argue with our incorporating them into the IPM systems we are trying to use to reduce the amount of real pesticides in our environment?"



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