Rossi redefines some beliefs about *poa annua*'s winter hardiness

By MARK LESLIE

TORONTO — One of annual bluegrass's dominant characteristics, its extraordinary photosynthesis rate, is more crucial than are external influences to its struggle against winter injury, according to Dr. Frank Rossi.

Speaking at the Canadian International Turfgrass Conference here, the Cornell University scientist said the cause of winter injury to annual bluegrass, or *poa annua*, "is rarely ice, and it's rarely many of the things we worry about. More often, it's that the plant is growing quickly in the spring."

Too quickly, that is, when fluctuations in temperatures cause *poa annua* to break out of dormancy with a spurt of new growth, only to be hit by a sudden freeze that kills the plant.

Explaining that "our thinking has changed quite a bit about this topic [winter hardiness of *poa annua*]," Rossi said it is a complex issue simply because *poa annua* is "a true winter annual; it germinates in the fall; it prefers to over-summer as a seed; and it prefers to go dormant in the summer when people are playing golf."

Rossi told superintendents that winter injury is "a complex of actions" and "rarely is it caused by a single thing, which makes it difficult for a researcher to study and for you to control."

Factors that can contribute to winter injury are poor drainage, excessive late-fall nitrogen applications, excessive late-fall irrigation, lack of thatch control, close cutting height, and inadequate potassium levels, although there are no tests showing more potassium enhances *poa annua*'s winter hardiness.

But because of the impact of quick growth, Cornell researchers have centered their efforts on delaying *poa annua*'s breaking from dormancy; and increasing the storehouse of carbohydrates, or energy, in the plant so that when a freeze occurs the plant can better survive it.

"Research indicates a relationship between disease incidence and energy levels," Rossi said. "We wondered if there was a way we could get the energy levels in the cell enhanced so that the cell doesn't dehydrate?"

Also, some research indicates that plant growth regulators (PGRs) increase energy levels in plants because carbohydrates are stored rather than used for growth.

"One of the things we learned," Rossi said, "is that PGRs aren't far from herbicides and you can cause damage with them."

But, on the positive side, using an extremely low rate of the PGR Primo (*Trinexapac*), researchers were able to accumulate carbohydrates much above that in a normal plant, he said.

He cited the Canadian Prairie Turfgrass Research Center's finding that just a 24- or 48-hour warming period substantially reduces winter hardiness of *poa annua*, taking 8 to 10 degrees Centigrade off its normal hardiness levels. "That's a significant finding because it is an indication of how quickly annual bluegrass breaks its dormancy," he said.

"We've had some dramatic results with Primo," he added. "When we had five days of freezing, thawing, freezing, thawing, we substantially enhanced annual bluegrass survival."

For Canadians, who cannot buy Primo, Rossi said: "Even though you might not be able to use Primo, your focus should be on maximizing hardiness going into the winter: applying late-fall fertilizers, raising the mowing heights, minimizing traffic and other actions that injure the plants late in the season."

"Things that might compromise those energy levels are going to impact the plant's ability to survive the winter," he said.