Overland Park's 'support' group includes, left to right: St. Andrews superintendent Terry Rodenberg, Westlinks superintendent Russell Bonneville, manager of golf operations Sandy Queen, Overland Park assistant super Steve Olson and Overland Park superintendent August Lietzen.

on the previous year's attendance, Queen has had some extra money lately.

"This is a self-sustaining course operation that has to pay the city a 12 percent overhead," he says. "We budget very aggressively to make sure any extra funds stay in the golf department. I should never exceed my forecast."

The city's master plan includes $6.5 million to improve golf facilities over the next 10 years.

—Jerry Roche

(For more information on 'Ready Golf,' contact Sandy Queen at (913) 897-3805.)

Keeping excess water off greens

■ Researchers at the IFAS Fort Lauderdale Research and Education Center are finding out just how pesticides applied to a USGA green *can* leach into the groundwater.

For the past two years, they've been carefully monitoring pesticides on and under their own USGA-spec green, and the leachate which passes through it.

This isn't an idle exercise. Groundwater is used by 50 percent of the U.S. population (90 percent in rural areas) for its drinking water.

What the Florida researchers are discovering is both good news and bad news for golf course superintendents.

The good news—From one of the researchers, Dr. John Cisar:

For a pesticide to affect groundwater, it (or one of its metabolites) must make its way through the turfgrass. Turfgrass forms dense plant communities that contain up to 2,000 to 3,000 plants per square foot. Many turfgrasses produce thatch that's high in organic matter that can bind up pesticides.

"As a biological filter, turfgrass is second to no other plant material," says Cisar, associate professor of turfgrass management and water at the University of Florida.

The work at Fort Lauderdale confirms what other researchers have discovered—some pesticides never get very far into the soil before they're broken down. They are subject to photo-decomposition at the soil surface, also by chemical decomposition or biological degradation in the soil.

Even so, once a chemical does leach below the rootzone, because of excess irrigation or rainfall, it's less likely to degrade. And if its journey is through sand, the likelihood of groundwater con-

Dr. George Snyder discusses the fate of pesticides applied to this USGA-specification green during the Turf Field Day in Ft. Lauderdale.

Stainless steel containers filled with the same layers of materials as the green allow researchers to capture and measure leachate.

tamination increases.

Today's sand-based greens—usually containing about 20 percent by volume of organic matter and little or no clay—allow, in some instances, pesticides (or their metabolites) to percolate to the groundwater. That's the case at the research green in southeast Florida where the groundwater is just five feet below turf which is maintained identically to a course there (without the play, of course).

"You have a system that's actually geared toward, and possibly favoring, moving pesticides off site," says Cisar.

The bad news—The researchers determined that there is risk of contaminating groundwater, particularly if a green is irrigated excessively. They discovered this by collecting leachate from large, stainless steel containers buried under the research green.

For instance, they found metabolites of the nematicide fenamiphos in the leachate a few days after an initial application of the material during their first study in November 1991. The parent compound is strongly absorbed by organic matter, but the metabolites (also active against nematodes) are less strongly absorbed and more leachable.

"If you are going to be using Nemacur (fenamiphos), really be careful about excess irrigation, especially after a first-time application," says Cisar. "If you irrigate excessively, you're going to lose some of the pesticide and you may not get the nematicidal activity that you want."

During the second test in January 1992 there was a substantial drop in the amount of chemical found in the leachate, says Cisar. He attributes this to decreased perculation and to enhanced degradation of the pesticide by microbes.

The research project is receiving strong backing from the USGA, the Florida Turfgrass Association and the South Florida Golf Course Superintendents Association.

—Ron Hall