MAINTENANCE

**Fist attacks effluent problems at the source**

By Andrew Overbeck

BARRINGTON, Ill. — With more courses using effluent water for irrigation purposes, more superintendents are being forced to irrigate with less than ideal water. Untreated effluent can cause numerous agronomic problems due to its usually high bicarbonate and sodium levels.

Superintendent Ted Fist at Wynstone Golf Club here has eased these problems in one simple step by convincing homeowners to switch their water softening agents from sodium chloride to potassium chloride. Under the terms of the development agreement, Fist is obligated to use wastewater from the 345 homes that surround the course. Wynstone’s water supply, which is drawn from five wells, is very hard and has bicarbonate levels of 370 parts per million. As a result, 88 percent of the homes use water softeners, and Fist knows that prior to 1999, sodium chloride was the predominant water softening agent. After the waste water runs through a two-stage lagoon treatment system, Fist has an irrigation source that has sodium levels above 300 parts per million, resulting in base saturation levels of 48.9 percent sodium and 20.6 percent magnesium.

“Water conditions created severe infiltration and soil structure problems,” said Fist. “The turf would wilt very quickly in the summer under moderate stress conditions. Trees would defoliate. It was free water but it wasn’t very good.”

Back in 1990, the club installed an acid injection system to combat the bicarbonate levels, but Fist knew more had to be done to combat the sodium levels.

He first determined that the levels on the homeowner’s water softeners were set too high and worked with the Wynstone

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**Klingstone protects bunker investment**

By Andrew Overbeck

WAYNESVILLE, N.C. — When it comes to keeping bunker sand consistent and free of contamination, many courses are turning to liners and other materials.

One lining product recently received a patent for its unique polyurethane material that binds directly to the top layer of soil to create a barrier that eliminates contamination of bunker sand and soil on the homeowner’s water softeners points.

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**Achieving bunker consistency is a Herculean task**

By Kevin J. Ross, CGCS

Other than the condition of greens, bunkers are the most talked about and controversial area of the golf course. Most of the talk is from golfers, and superintendents have all heard the comments: too soft, too hard, too wet, too dry, too much sand, too little sand, too inconsistent. While bunkers are a hazard, it is up to superintendents to ensure that they are a fair hazard.

The most important part is the sand quality.

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Fist enlists homeowners to solve effluent problem

Property Owners Association to dial back usage of sodium chloride. That reduced sodium levels to 180 parts per million, but Fist was still not satisfied.

"In 1999 we began a study to determine the benefits of using potassium chloride as a water softening agent instead of sodium chloride," Fist said. "We started the program by providing every resident with six bags of potassium chloride three times a year."

Within three months of starting the program, Fist began to see results.

"We saw significant increases in the potassium concentrations in the effluent," Fist said. "Potassium levels are now at 170 parts per million and sodium has declined to 82 parts per million."

"Because the irrigation water has improved, the soil conditions are better. We are not wilting as fast, the trees are not defoliating and we are able to reduce the amount of potassium in our fertilizer program," Fist added.

Fist is able to cut back his fertilizer use because of the added potassium in the water. He applies 33 million gallons of water on 100 acres of irrigated turf, which converts to 10.5 pounds of elemental potassium per 1,000 square feet.

Wetting agent research

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sites across the country."

The project will cost $200,000 and will be split between the GCSAA and USGA. Throssell said the study will not look at all the wetting agents on the market, but that it will focus on the products that are more widely used by superintendents.

Many industry insiders and some superintendents are wondering why the two organizations have decided to start with a wetting agent study, as opposed to organic products or off-patent versions of Roundup.

"It was felt that the wetting agent category was one that was widely used and one which there is not much comparative research on," said Throssell. "This is intended to be a pilot project. After we finish we will see what the response is from members and industry and then determine how to handle more research."

While Throssell stresses that the project is a test case, the USGA's Green Section director Mike Kenna is hopeful that the program will expand beyond the initial study.

"We both owe it to our members to do oversight," he said. "We all know there are things that are advertised and sold that we don't know a heck of a lot about. So maybe this is something that we can provide through an ongoing research program."

If the research project is a success, Throssell said future studies could potentially include biostimulants and other products that have not been widely studied.