

GOLF COURSE NEWS

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Watershed findings: Pesticides test well

By STUART COHEN & TOM DURBOROW

Thousands of water samples from golf courses have been subjected to more than 100,000 analyses in 13 projects since the Cape Cod Study was completed in 1988, and only five samples contained pesticides above health-based action levels.

In fact, only 30 to 60 samples had even quantifiable pesticides, substantiating indications that proper golf course maintenance does not endanger water supplies.

Most of these studies have been done as a result of permitting requirements, occasionally as a result of research projects. With a few exceptions, they have not been well publicized. The reasons are that most of the studies have not been completed, and, equally important, the results are mostly favorable for the golf industry. It is hard to use good news to scare people.

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ECOLOGICALLY SOUND

This used to be a parking lot. Now it's Squaw Creek Golf Resort in Squaw Valley, Calif., perhaps the nation's most ecologically sound golf course. It's also the top mountain course to open during the last five years, according to an exclusive Golf Course News survey of architects. For story, see page 35.



ARCHITECTURE'S HOTTEST DUO

Ben Crenshaw (left) and Bill Coore are making news: Barton Creek, Kapalua, and now the much-anticipated Sand Hills. They spoke with GCN, page 35.

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State associations build/buy, manage their own courses

By PETER BLAIS

To provide improved member services and increase public play, a growing number of local golf associations are building and buying golf courses.

The Northern and Southern California golf associations along with the Oregon State Golf Association are developing their own facilities.

"Many other groups are talking about doing something similar," said Tom Morgan, executive director of the Southern California association.

The Northern California association started the golf ball rolling in 1975 when it acquired an option on 165 acres of Del

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No. 3 at Rancho California, soon to be owned/managed by the Southern Calif. Golf Association.

Arizona groups eye golf tax to benefit turfgrass research

By MARK LESLIE

PHOENIX, Ariz. — Following unproductive campaigns to raise research funds through volunteer donations, the Arizona green industry is taking steps in a new direction.

The newly formed Commodities Group is drafting legislation that would assess 10 cents per round on golf played in Arizona. The levy could potentially generate \$800,000 a year, according to Mark Clark, president of Cactus and Pine Golf Course Superintendents Association and superintendent at the Country Club of Green Valley.

Similar assessments reportedly have worked well for lettuce, citrus and grape growers, who all tax each crate of produce to fund research and development

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William Schultz

Schultz to assume leadership role at CMAA conference

By PETER BLAIS

SAN ANTONIO, Texas — A resident Texan will be elected president of the Club Managers

Association of America when the group holds its 67th Annual Conference here Feb. 6-10.

William Schultz, general manager of Houston Country Club since 1990, will assume leadership from outgoing President Richard Kolasa.

Schulz has been on the board since 1988, serving on several national committees and community organizations during that time. He graduated from Milwaukee Area Technical College and is currently CMAA's vice president.

In addition to Houston CC's 18-hole Robert Trent Jones-designed layout, Schulz has overseen Twin Orchards CC in Long Grove, Ill., and Brynwood CC in

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Finally, scientific 'meat' supporting golf greenkeeping

Continued from page 1

Studies are being performed at dozens of golf courses around the country (see related story on following page). For this article, we reviewed interim results from 13 of the most important ones. Conducted at 25 golf courses in eight states and one territory, they have been done for various objectives, in a variety of climates and hydrogeologic settings (see accompanying table). Therefore, it can be difficult to compare results.

The extent of pesticide analyses has also varied widely. No pesticides have been analyzed in four (31 percent) of the projects. In some cases, the extent of pesticide analyses can be best characterized as overkill. More than 70 pesticides — many rarely used on golf courses — have been analyzed in at least one of the studies.

So what have we learned? Following is a summary of some of the general trends and conclusions we have been able to extract from these preliminary results. (Note the accompanying article on the Kiawah Island study, which is taking a comprehensive look at how the ecosystem is responding to turf management and a semi-enclosed irrigation/effluent water-recycling system.)

PESTICIDES FOUND

- Confirmed detections of turf pesticides in water are rare but they do occur. Of the more than 100,000 analyses that have been performed on thousands of water samples since the Cape Cod Study, we estimate that 10 pesticides in ground water have

Stuart Cohen has a Ph.D in physical organic chemistry and is a certified ground water professional. He is the president of Environmental & Turf Services, Inc. in Wheaton, Md. He was director of the Cape Cod Study. Tom Durborow has a bachelor's degree in environmental resource management from Penn State University. He has extensive experience in computer simulation modeling, as well as soil and water monitoring.

Thirteen of the most important studies, and what those studies tested for, are listed here. They were conducted at 25 golf courses in eight states and one territory.

been detected above the practical quantification limit (PQL), and 11 have been detected in surface water above the PQL. The number of pesticide detections in the 13 studies is probably between 15 and 30 for ground-water and 15 and 30 for surface-water samples.

The detections have usually not posed a hazard. Only bentazon, arsenic and simazine have been detected in these studies at concentrations exceeding lifetime drinking water Health Advisory Levels or Maximum Contaminant Levels (MCLs). We are aware of only one other turf chemical — cadmium — detected in ground water at concentrations exceeding the MCL; that was in a study not included in this group. We are aware of no other surface-water violations (but see the discussion of modeling results below).

- Nutrient concentrations have occasionally increased above background levels. There have been some increases of nitrogen and phosphorus in receiving waters, but these increases tend to fall within normal ranges expected for these constituents in similar settings.

There seems to be no pattern to the increases based on a casual inspection of the data. A pattern could probably be elucidated following a complex analysis of all key parameters, such as the source of nitrogen, use of reclaimed wastewater, extent of dormant feeding, and soil type, texture and cation exchange capacity.

- Studies of wildlife, fish and biota indicate healthy communities. No impacts on the ecosystem have been detected as the result of use of turf chemicals.

Study Site	Ground Water	Sediments	Surface Water	Pesticides	Nutrients	Biota
Maui Kaanapal	No	Yes	No	Yes	No	No
Virginia Greendale	No	No	Yes	No	Yes	No
Maryland Avenel	No	No	Yes	No	Yes	Yes
New Jersey DEPE	No	Yes	Yes	Yes	No	No
Maryland Caves Valley	Yes	No	Yes	Yes	Yes	Yes
Florida USGS	Yes	No	Yes	Yes	Yes	No
Hawaii Waikoloa	Yes	Yes	Yes	Yes	Yes	Yes
Mass. Bayberry Hills	Yes	No	No	Yes	Yes	No
Florida Lake Worth	Yes	No	No	Yes	No	No
S. Carolina Kiawah	Yes	No	Yes	Yes	Yes	Yes
Texas Barton Creek	Yes	No	Yes	No	Yes	Yes
Guam Guam Muni	Yes	No	No	Yes	Yes	No

- Some of the detections are suspicious. There is always a chance for false positive detections, and we suspect that has happened in one or two cases. We also suspect that some detections are due to upgradient sources such as farms. Good monitoring studies should always include upgradient and/or baseline sampling.

- Golf courses seem to decrease sediment loading to surface water. Only one of these 13 studies examined this issue. But we have evaluated sediment loading extensively through computer simulation modeling and reviews of the literature. Turf can reduce sediment loads significantly during storm events, compared to all other land uses except urban-paved.

The results of these studies are consistent with simulation modeling we have done. Our only significant concern is about applying highly toxic pesticides in areas that drain to sensitive water bodies a few days before major storm events.

More studies are needed, but with careful thought given to the selected environments and analytical parameters.

On the one hand, expensive analyses are being performed for too many parameters in many cases.

On the other hand, several key types of environmental settings have not yet been represented in these studies, while others are over-represented. But that happens when such studies are driven by permitting authorities rather than research needs.

Overall, these results show that golf courses can be managed safely without impacting surface-water or ground-water quality. But there is a saying that "all politics are local."

The same can be said about risk assessment. The superintendent must consider his or her site-specific environment when applying turf chemicals.

So, to coin a new phrase, all risk assessments are local. As long as we all remember that fact, and know where to turn for expert guidance, golf courses and the environment can co-exist happily.

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APPLICATIONS:

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