Important Limiting Factors in Golf Course Quality: Pesticides and Water

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The past three decades have produced many changes in the way that golf courses are managed. In addition to lower cutting heights and faster ball rolling speeds, reduced fertilizer inputs, more closely controlled irrigation practices and the increase in golfer traffic have all affected the way superintendents approach turf management. During this period, the turf management community has had access to a steady supply of newer and better pesticides to help maintain the best playing conditions possible. In the mid-90's, however, the EPA moved to reevaluate many of the pesticides on the market and to increase the stringency with which new pesticides are approved. While this has resulted in pesticides of lower environmental and mammalian toxicity, it has also forced some pesticides off the market and reduced the overall pool of potential new pesticides. The ultimate result for the golf course superintendent is that fewer chemicals are available for managing turf.

Unfortunately, It does not appear that a glut of new pesticide chemistries are likely to make it to the turf market anytime soon. The last truly new fungicide for turf use came to market in 1998. Since then, new products have been developed but all of these new products are really just minor improvements on old technologies. A new insecticide with a novel mode of action was released to the turf market in 2008 (Acelepryn®), however, no other new insecticide chemistry had been developed for the 20 years before that. There are a couple of new herbicide chemistries being registered for turf but once again, most of the developments in this area over the past decade have been improvements or modifications of older technologies.

While it is clear that environmental regulations play a major role in which pesticides are brought to market, development cost is also a huge factor in the process. It has been estimated that it now costs between $200 and $250 million to develop, register and market a pesticide. Additionally, each company that brings a chemical into the marketplace typically has between 4 and 7 years (out of a 17 year patent lifespan) to recoup those costs and start to make a profit. And once the pesticide is off patent, competition can be fierce. Finally, most pesticides start in the agricultural sector for use on corn, soybeans, vegetables, etc. Turf use is often a secondary use because the turf market is so much smaller than traditional agriculture. When all these issues are considered, it is not surprising that fewer pesticides are finding their way through registration and into the superintendents pesticide shed.

As mentioned previously, the 1996 FQPA (Food Quality Protection Act) not only changed the way in which new pesticides were registered, it also called for a review of many older pesticides. This resulted in some pesticides being removed from the market and their registrations cancelled, while other chemicals had their rates and labels substantially changed. The most salient example for golf course superintendents was the cancellation of Nemacur® (fenamiphos). As the only turfgrass nematicide on the market, this chemical was the single option for northern golf courses with damaging nematode populations. There is currently no replacement for fenamiphos or any alternative registered product for nematode control.

In addition to federal regulations, states and municipalities are engaging in pesticide use policy more so than ever before. New York State and Massachusetts have

been particularly active in restricting the use of certain pesticides in both specific locations and statewide. And municipalities are often restricting the use of pesticides on newly built courses, sharply limiting the quantity and type of chemical that can be used. Golf courses have historically been excellent stewards of the environment, despite the necessary use of pesticides on the course. Homeowners and large agricultural farms are far more likely to cause both pesticide and fertilizer pollution than golf courses. Unfortunately, golf courses are an easy target for regulation and highly visible within suburban population centers. And while certain municipal restrictions may sometimes appear misguided or capricious, the ultimate goal is to improve environmental quality and reduce human exposure to pesticides. This is something we should all favor.

The loss of important chemistries, the development of fewer new chemicals and additional restrictions from government agencies make the management of golf courses more difficult. Certainly there are ways to manage a golf course with fewer pesticides but the required approaches often have a cost in playability and aesthetic quality. However difficult it is to manage golf courses with fewer pesticides, it is impossible to grow grass without water. Nationally and internationally, water conservation and water use policy is becoming a major consideration for politicians and government regulators.

Golf courses are huge consumers of water. Some estimates place the daily water consumption of a fully functional golf course during the summer months as equivalent to the use of 4,000 people a day. In many small New England towns, this is easily half the population. Consequently, new golf courses are now seeing many more stipulations placed on their use of local aquifers. In fact, fewer golf courses are even making it through the permitting process because of their potential impact on local water supplies. While it is more difficult to impose regulations on existing courses, it is not unthinkable. In many places around the country where drought has recently stricken, golf courses have been required to reduce water usage. Home lawns and residential uses are often targeted for water conservation first, but golf courses inevitably follow. It is absolutely critical that golf courses begin to think about their water use now and continue to participate in the debate with states and municipalities.

Although pesticides and water use may seem to be disparate issues, they do converge on the golf course. One of the primary reasons that states and municipalities have begun to restrict pesticide use is expressly for the purpose of preserving water quality. In some areas, new courses are now being built with monitoring wells, in order to determine whether pesticides are moving into the ground water. In other golf course locations, particularly those built on predominantly sandy soils, the risk of contamination is considered high enough that large groups of pesticides are outright banned. Water quality is just as important, if not more important, than water conservation. Golf courses need to be cognizant of all these issues into the future because we will only see more regulations and more restrictions.

In summary, turf management in 2010 is very different than it was thirty years ago. While our expectations have increased, we may actually have fewer tools to manage golf courses than we have had in the past. Both the regulatory burden and environmental restrictions placed on golf courses are constantly expanding. In this context, it is absolutely critical that golf courses begin a transition to managing with fewer resources before it becomes forced upon them.