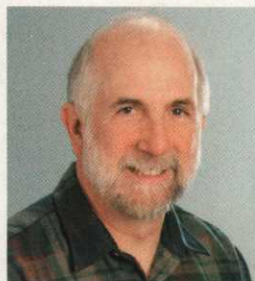


# Revving Up for Biodiesel Technology



TORO'S STEVE WOOD DISCUSSES COMPANY'S  
ROLE IN IMPLEMENTING BIODIESEL  
TECHNOLOGY *By Larry Aylward, Editor in Chief*

**A**t the Golf Industry Show in February, The Toro Co. announced that all of its diesel-powered golf course, sports field and grounds equipment will be made Biodiesel Ready by 2008. This includes the Toro Reelmaster, Groundsmaster, Greensmaster, Workman and Multipro product families.

"Our biodiesel readiness initiative is part of a commitment to developing innovative solutions that meet the evolving needs of our customers and help to better the environment," said Toro's Chairman and CEO Mike Hoffman in a prepared statement. "The time is right for Toro and the industry to commit to this effort."

Steve Wood, manager of Toro's Commercial Test Engineering Department and the leader of Toro's Engine Specialization Team, has been the project leader for Toro's biodiesel testing program that began in 2002. He also has been one of the primary advocates at Toro for making biodiesel technology available to its customers.

Toro recently spent time with *Golfdom* to answer these questions:

**Why did Toro decide to pursue this initiative five years ago through extensive equipment testing?**

Wood: Toro had periodic inquiries from customers who wished to operate their fleets on biodiesel, and we did not have an experience base to be able to answer their questions about how

well this would work and what problems might be encountered. Our engine suppliers also had very little experience with biodiesel, but two of them agreed to participate in the test program for the first two years with Toro. Many of the customers asking about biodiesel wanted to be able to run on B100 (100 percent biodiesel) fuel, so this is what we tested.

**What did Toro learn about this concept through testing? Why did Toro decide to roll it out now?**

Wood: We learned that our diesel-powered equipment ran quite well on biodiesel fuel overall. We experienced some minor problems with fuel hose degradation, premature fuel filter

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plugging, cold-weather waxing, and fuel dilution of the crankcase oil in some of the vehicles. But for the most part there was no perceptible change in the way the engines started or performed. It took quite some time to develop solutions for each of these problems and to qualify the new components required. There was also some hesitation internally to support the use of biodiesel beyond what our en-

gine suppliers were willing to endorse or recommend.

**How long have your customers been asking for this technology? What has been the reaction from superintendents to your initiative?**

Wood: Toro has had occasional inquiries from both domestic and international customers for at least seven years. Biodiesel fuel wasn't widely available during most of this time, and the cost for B100 was roughly twice that of petroleum-based diesel fuel. Within the last one to two years, availability and public awareness about biodiesel has increased, and cost has approached parity with petroleum fuels. Reaction from the booth visitors at the Golf Industry Show, including golf course superintendents, was extremely positive. They are aware of the advantages of biodiesel fuel, which is better for the environment because it's renewable and produces lower emissions.

**In 10 years, how do you think fairway mowers, greens mowers and utility vehicles will be powered?**

Off-highway equipment, such as commercial lawnmowers and utility vehicles, will still be powered by internal combustion engines for some time to come at least for 10 more years. The availability and cost of fuel will play a big factor in which types of engines will be preferred, as will fuel efficiency, cost, and exhaust emissions. The Tier 4 standards for diesel exhaust emissions starting in 2012 will trigger more complexity and cost than in today's products. Hydrogen-powered engines and/or fuel cells will begin to make some inroads within this time but are unlikely to be the mainstream products. ■

*Editor's note: For a podcast of a similar interview with Wood, see [www.golfdom.com/onlineexclusive](http://www.golfdom.com/onlineexclusive).*