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RTV900 Turf Utility

The Kubota RTV900 Turf utility vehicle is designed to make your job a little easier and a whole lot more productive. With a fuel-efficient 21.6 HP diesel engine, 4-WD, power steering, 3-range variable hydrostatic transmission (VHT), hydraulic bed lift and a hydraulic utility valve, it's everything you need to get the job done.
experience in hydrogen fuel cells.”

Toro will provide NFSP with three hydrogen-powered utility vehicles based on their Workman E-2065 chassis. Turf managers got their first glimpse of the hydrogen-powered Workman at the 2007 Golf Industry Show.

The utility vehicles are used by NFSP and Beaver Island State Park and Golf Course to shuttle workers and grounds equipment, drag infields, haul turf materials, and assist with refuse and snow removal. “Through our partnership with Toro, we will be able to put this exciting fuel cell technology to work,” said Carol Ash, acting commissioner of the New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP). “The use of fuel cell vehicles at these facilities will enhance our operations relating to grounds, turf, and refuse and snow removal, as well as highlight our continuing commitment to supporting sustainable energy and Green Park initiatives throughout our system.”

This is not production-ready equipment, Lonn emphasizes. “It is a technology evaluation and planning exercise,” he says.

Early on they encountered their first glitch: the hydrogen production facility was delayed.

Lonn notes that hydrogen power is an excellent option for government or warehousing applications where a single fueling location can support a fleet, as opposed to the general automotive business where a flock of hydrogen stations would be required to support highly mobile auto users.

Fueling with hydrogen is much like fueling with gas or diesel. A fitting is connected to the port and gas—rather than a liquid—is pumped into the tank. In about a minute, the vehicle is refueled and ready to go. Compare that to the process of removing and recharging batteries.

In addition, Lonn notes, battery powered vehicles “get wimpy” at the end of a charge. Hydrogen cells simply need to be refueled.

The New York State Energy Research and Development Authority (NYSERDA) is contributing $380,025 toward the project. In response to the Executive Order, NYSOPRHP has an aggressive green parks initiative to support the advancement of hydrogen technology in New York.

The NYSERDA-funded project included hydrogen fuel cell vehicles because they generate minimal emissions. Other benefits include reduced noise, increased machine efficiency over gasoline- or diesel-powered equipment; rapid refueling versus recharging of battery-operated equipment; and low emissions (fuel cells emit water vapor as a byproduct).

Lonn notes that sports and government applications of fuel cells are ideal for testing the technology. County park systems, school districts and the like are eager to be good environmental stewards. Often, grant money or dollar-matching is available from states. “It is politically viable to help a government agency (as opposed to a private business),” Lonn notes.

The Niagara Falls project is being evaluated and the prognosis is good. “Hydrogen will be here in the nearer term, not long term,” Lonn says.

Auto manufacturers

That is because this is not futuristic technology. And it is not just the turf world where alternative power is available. General Motors is rolling out a hydrogen fuel-cell powered fleet of Chevy Equinox vehicles at the New Year. Honda has its own version. BMW’s X-6 has two electric motors backing a gas engine and Mercedes has its 450 hybrid that uses lithium-ion batteries. Nissan is working on something called the Mixim, which will use similar batteries with a quick-charge feature.

Lonn notes that the future of battery power is not tied to the auto industry. However, he says the sheer volume of auto production will help drive costs down.

In the groundskeeping world, not all electric innovation comes from the “big name” companies. A Santa Rosa, CA-based firm called The
Whether you maintain municipal grounds or professional stadiums, as a sports turf manager the responsibility is the same — establishing and maintaining safe and aesthetically pleasing playing fields — and the Program from Scotts Professional Seed has turf grass varieties that will help.

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Electric Vehicle Company is marketing its ZAP Xebra PK all-electric utility truck. "It is the only street-legal electric truck on the market," claims Bob Kopach, vice president of the firm. It has a 110-volt on-board charger.

The PK costs about three cents a mile to operate and can hit speeds of 40 mph. A three-wheel unit, it has two seats and weighs 1880 pounds. It can carry up to 500 pounds in its bed. The PK, which lists at $11,750, is a zero-emissions vehicle.

"The bed is configured so it can be used as a pickup truck, a dump truck or a flatbed," Kopach says.

**Building biodiesel**

Biodiesel is an alternative fuel source derived from biological sources that are completely biodegradable and non-toxic—typically corn. Emissions from bio-fuels and biodiesel blends are lower than petroleum-based diesel fuels making them more environmentally friendly. There are various levels of biodiesel blends including B2, B5, B10, B20 and B100. For example, biodiesel fuels designated as B20 represent a mixture of 80 percent petroleum and 20 percent bio-fuel.

John Deere’s sports turf and golf equipment currently is approved for B5. Aldridge says they are working on getting B10 and B20 approvals. Like many others in the industry, he cautions turf managers to be sure of the quality of biodiesel coming from their suppliers.

The Toro Company has hopped on the biodiesel bandwagon, stating that all of its diesel-powered sports fields, golf course, and grounds equipment will be "Biodiesel Ready" by this year. The list of equipment this covers includes the Reelmaster, Greensmaster, Workman, and MultiPro product families. Beyond these specific product families, Toro will continue to expand the use of biodiesel fuels in other diesel-powered equipment lines.

"Anything we offer in 2008 will be B20 compatible," Lonn says.

"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," says Mike Hoffman, chairman and CEO of Toro.

"The time is right for Toro and the industry to commit to this effort," Hoffman adds.

The company also has upgrade kits for the above-mentioned product families to convert diesel models already in production or in the field to be compatible with biodiesel fuel. "They are simple to install," Lonn notes. The main job is to switch out fuel filters and install fuel lines made with compatible materials.

For the past 5 years, Toro has conducted extensive equipment testing using bio-fuel and biodiesel blends. With kit modifications and an understanding of a few additional precautions customers can enjoy a more efficient, cleaner technology through biodiesel fuel blends of up to B20. "It’s a relatively minor job," Lonn adds.

**Hybrids**

"Hybrids are now cost-effective in our industry," says Aldridge. Deere’s 2500E is a Hybrid Riding Greens Mower with a 19-hp diesel or gas engine. "The engine powers a 48-volt alternator," Aldridge explains.

That alternator drives the reels. For starters, the electric reduces the overall noise level by 3 decibels, significant in many markets. However, there are other benefits, as well.

Reduced noise levels allow for early morning mowing without disturbing folks who may live nearby the facility. This opens up the window of opportunity to get mowing done earlier in the day.

The 2500E runs at half throttle without sacrificing reel speed. This means a high cut quality, but less fuel consumption compared to other systems.

"We see greatly increased fuel efficiency, with savings of up to 30 percent," Aldridge says. With fuel prices hovering around $3 nation-

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**Lithium has promise, challenges**

Whether for sports turf equipment, computers or automobiles, lithium has the most promise as a battery power source. It is far more energy-dense than lead-acid. But it also has challenges.

"There are charging issues," says Dana Lonn, director of Toro’s Center for Advanced Turf Technology. When one leaves a lead-acid battery to charge and it becomes full, it “pushes back” against the charger. Lithium does not do that.

Instead of over-charging, a lithium cell will get hot. Remember the computer laptop recalls due to fire danger? This was precisely the cause.

Lonn says the answer is smarter chargers. “A BMS (battery management system) can make the chargers smarter, allowing them to monitor voltage and cell temperature,” he says.

He also would like to see cell volume increase. But the first challenge is to have better management of the charging process.

wide, a 30 percent savings brings the cost of a gallon down to the $2 range.

There is a quality bonus, too. "About 90 percent of the leaks on reel mowers are at the cutting reel," Aldridge says. While the 2500E still has traction drive and hydraulic lift and lower, the alternator drive cuts the number of hydraulic points dramatically.

"The 2500E eliminates 102 potential hydraulic leak points," Aldridge says.

Even for an operation using biodegradable hydraulic fluids that is a big bonus. Besides, if a typical machine requires hydraulic fluid changes every 200 hours, with biodegradables that interval drops to every 100 hours. There are other savings, too.

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Whether you’re growing sod for sports fields, commercial landscape or residential lawns, Defiance XRE with rhizomes is the key to robustly beautiful turf.

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With its rich dark green color and proven Brown Patch resistance, the roots of Defiance XRE reach deep into the soil for exceptional water absorption and less frequent irrigation. It also relies less on chemical input than comparable mixtures, giving it an environmentally friendly answer to the on-going challenge of providing hearty, lush turf for our clients. Defiance XRE is a proven favorite.
"Just in hybrid technology, we see a 50% reduction in horsepower requirements for the same output," Melka says.

The result is a lighter machine to do the same amount of work.

The prototypes of the hybrids of tomorrow are more compact machines than today's gas or diesel models. That is reflected, as well, in the unit's reduced weight.

On top of that, there are significant reductions in the emissions from the vehicles.

"There are reduced parts costs, too," Melka says. The newest designs do not need the additional hydraulic hoses and other fittings that add to the maintenance costs.

"Hybrids are easier to work on, too," he adds.

Plug into electric

At the lower end, electrical mowers already are available for working around buildings and in tight quarters.

However, the electric mower is not condemned to a 21-inch pusher. Most manufacturers are well along in their plans to come out with big electrics.

The first objection most turf managers will raise is to the weight of an electric unit.

"Lead-acid batteries are heavy," Melka concedes. But the latest technology is based on lithium-ion batteries, the same technology typically seen in cellular phones and joggers' personal music devices.

"Lithium ion batteries are scaling up in size. They offer as much as a 75 percent weight savings over the old lead-acid batteries for the same output," Melka says. That last part—about having the same power output—is a key.

In addition, the cost of the lithium ion batteries is coming down fast.

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Overseeding TifSport is a routine job as well. It provides an excellent base for ryegrass and ryegrass blends. If you're looking for a certified bermuda that can stand up to the stress and demands of big-time sports, to the wear and tear from the cuts, starts and sudden stops you get from football and soccer cleats, to the punishment of baseball spikes, relax, you've found it - TifSport. It's what many experts are calling the new standard in sports turf for the 21st century. For more info and a list of licensed growers visit our website or call 706 542-5640.

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as the technology is adopted, the size of the units it can power increase, and the places where it finds applications broaden.

"The cost is coming down rapidly," Melka says, adding that he expects to see broad lithium ion adoption in larger mowers in about three years.

Deere offers an electric Gator with eight 6-volt batteries. While batteries are okay in utility vehicles and run-arounds, there is a downside in using them in mowers. In addition to the potential for compaction, battery-run vehicles slow down as they lose charge—get wimpy, as Lonn noted. Reels are not running as fast at the end of the day as they are at the start. "That's why we chose to go hybrid with our mowers," Aldridge says.

Chris Harrison is a veteran freelance writer with experience in the turf industry.

Cool technology for cleaner cuts

There is some neat, new equipment that will appeal to anyone with upper-end turf maintenance needs, too. John Deere's 2500E Hybrid Riding Greens Mower provides the ultimate combination of new technologies. The reels on this unit are powered electrically rather than by traditional hydraulic systems, says Brad Aldridge, product manager, John Deere Golf & Turf One Source. The system uses a 48-volt alternator driven off of either a gas or diesel engine to distribute power to the reels. The 2500E can be run at half throttle without sacrificing any of its reel speed. This means a high cut quality, but less fuel consumption compared to other systems. The 2500E can save up to 30 percent more fuel than traditional hydraulic machines. Other benefits of the 2500E are reduction of hydraulic leaks and reduced noise levels. With the 2500E, John Deere eliminates 102 potential hydraulic leak points in the reel circuit. This means less opportunity for turf damage due to leaking hydraulic fluid. Reduced noise levels allow for early morning mowing without disturbing folks who may live nearby the facility. This opens up the window of opportunity to get mowing done earlier in the day. Ease of maintenance is key, too. "That's why we have added onboard electrical diagnostics to some of our machines, including the 3245C Independent Deck Mower and the 2653B Trim & Surrounds Mowers," Aldridge continues. "The John Deere WhiteBox controller allows operators and technicians to diagnose problems without even leaving the seat."
"I know I am a better sports turf manager because of this association. As sports turf managers, we take the challenge seriously to make our fields the best possible for the next game. The resources I have access to through STMA helps me do it."

— Bob Campbell, CSFM Higher Education Membership Segment

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Multi-Flow drainage
Stop in at the Multi-Flow booth (709) to discover how Multi-Flow has made synthetic turf drainage easy and affordable. See demonstrations about fast and easy ways to connect Multi-Flow to a round pipe transport system. Innovative turf drainage solutions will be featured as well.

New drag mats
Cambridge International will be featuring a new drag mat design at the Sports Turf Managers Association 2008 Conference. The new design features a heavier rod 11 gauge instead of the conventional 13 gauge along with a clinched edge instead of the conventional smashed edge. These differences increase the strength of the mats and also prevent distortion. The result: virtual elimination of the snagging that is typically experienced when using drag mats to groom fields. The new Rivet-Free U-Bar design allows for a truly reversible mat, with no more rivets digging into the surface of the field or turf if the mat is used the “wrong” way.

Cambridge International
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