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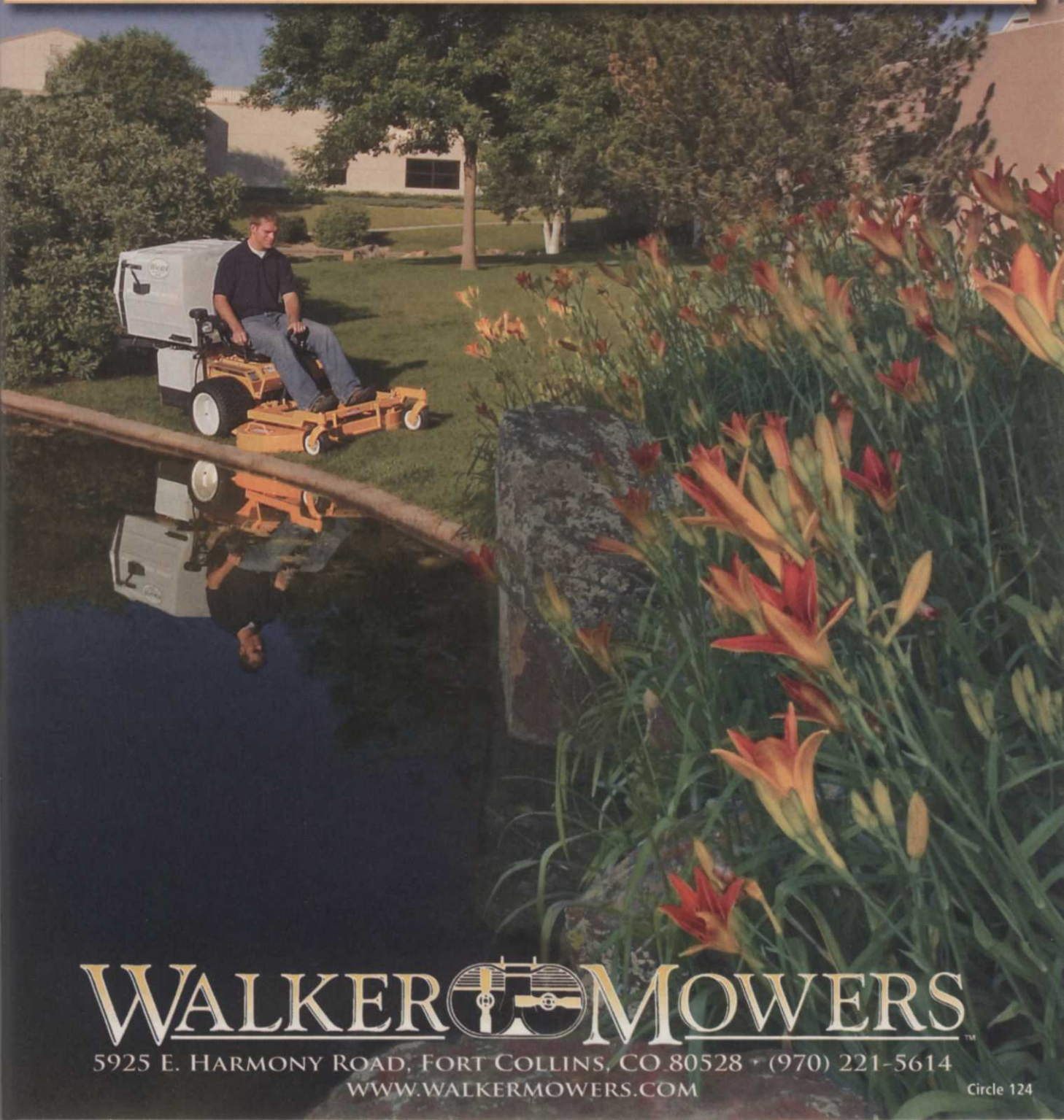

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Circle 124

PROPANE, a promising alternative

Fuel delivery system improvements and an in-place supply infrastructure give commercial cutters another fuel option

BY BRIAN KLINE

Several well-established companies now offer propane-powered units.

Four years ago Billy Morell converted five 48-in.-cut mowers to propane, running them on standard forklift propane cylinders.

"I've been a wrench turner all my life," says the supervisor of vehicle services for the Austin Independent School District (AISD). "I figured I'd give it a run and make it work."

Today Morell is running a stable of propane-fueled mowers with dual mower-dedicated 7 ½-gal. propane cylinders. Morell is so confident in propane that he's removing his 88-in. diesel tractors from service in favor of new 72-in. propane-powered mowers.

"That means big tractors that aren't on the road, crews that aren't split up and a lot of dollars saved on fuel," says Morell. "And in the end I'm getting a better cut."

Lower maintenance costs

Propane's higher octane level, higher compression ratios and closed systems, while being environmentally friendly, have another benefit – they lower equipment maintenance costs.

Tests have shown that oil, oil filters, spark plugs carburetors and engines in propane-powered equipment last up to three times longer than gasoline-powered equivalents and that during the lifespan of that equipment, fewer tune-ups are required. At present, new propane mowers can be somewhat more expensive than traditional gasoline equipment, but lower fuel and maintenance costs over the lifetime of the equipment more than balance the equation. Morell has seen the benefit for his fleet of mowers.

"I don't have water in my fuel; I don't have dirty carburetors, and if need be, my mowers can sit for a month or two, and they fire back up without any maintenance."

Lower fuel costs

For most grounds maintenance applications, propane is either delivered and stored in bulk tanks on site or delivered in ready-to-mount mower cylinders that are

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What is propane?

Propane is found in both crude oil and natural gas. Propane and other hydrocarbons like butane and ethane are byproducts of the refining process of those raw compounds.

Propane burns cleanly, especially compared to gasoline and diesel fuel. In fact, propane, which is approved under the Energy Policy Act of 1992 for use by federal and state fleets as an alternative fuel, has an octane rating of 104 to 107 and allows for a higher compression ratio, allowing a propane engine to run just as powerfully and more efficiently than with gasoline, which has an octane ratio between 87 and 93. As a result, propane-fueled vehicles can meet the very tough Ultra-Low Emission Vehicle (ULEV) standards. — *BK*

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re-filled by the supplier after use. Either way, there is a significant cost savings over gasoline. Overall, the price of propane compares favorably with the price of conventional or reformulated gasoline, historically running at under 75% of retail costs. Many states offer fuel tax incentives or alternative fuel benefits to encourage the use of propane, helping to further increase fuel savings.

Another center of expense — fuel shrinkage — is virtually eliminated in a transition to propane. Propane is, at present, not a common fuel for cars and trucks and is less vulnerable to theft in the field and on site. Also, because of propane's closed storage and delivery systems, fuel budget losses due to loss, evaporation, spillage and theft, as well as contamination from rain, dirt and other contaminates, are essentially eliminated.

Environmental benefits

A number of states across the union are either eyeing or actively pursuing legislation to cut the emissions of mower fleets owned by the state or its institutions. This, coupled with heightened senses of environmental and fiscal awareness at every level of business and education, bring new attention to clean-burning and economical propane as a fuel.

It is well known that the gasoline engines on grounds maintenance equipment, in particular, emit high levels of carbon monoxide, volatile organic compounds and nitrogen oxides. Those engines produce on average 5% of the nation's air pollution, a number that can be significantly higher in metropolitan areas. Emissions are so low that propane mowers can be used during "Ozone Action Days" – days deemed by cities or states as especially likely to foster the production of ozone – when the use of gasoline-powered engines is either prohibited or discouraged.

Envirogard 61 features EPA and CARB-certified engines.

Propane-fueled equipment has minimal emissions. Studies indicate that smog-forming hydrocarbons are lowered 60% to 70% in propane-fueled engines vs. gasoline, along with 12% less carbon dioxide, 20% less nitrous oxide and 60% less carbon monoxide. Toxins and carcinogens such as benzene and toluene are eliminated almost entirely as well, seeing a 96% reduction in their level.

Gasoline, in addition to being a heavy post-burn pollutant, is a spillage and evaporation hazard. While propane is a gas in its uncompressed state, it is stored as a liquid. "Closed" storage and delivery systems, meaning airtight systems that keep propane in its compressed, liquid state, prevent leaking and evaporative emissions by their nature – effectively removing spillage hazards from your environment. Should a leak develop in the system, propane escapes. As a non-toxic gas, the environmental impact is minimal.

Propane storage tanks are also safer to have at your facility, having been rated at up to 20 times more puncture resistant than gasoline tanks. On the whole, propane is a safer, more environmentally

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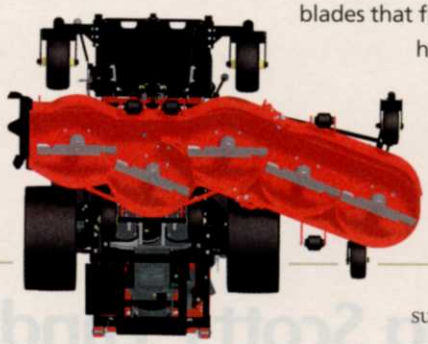
Articulators follow the lay of the land

One year after introducing articulating rotary mowers into the commercial market, Jeff Laskowski, founder and CEO of Indianapolis-based Lastec, is on a mission to build distribution. That, he says, is the biggest hurdle in getting the industry to recognize the inherent advantages of his products' design.

In spite of 20% growth since attacking the commercial market and growing distribution by more than 50 dealers, he admits that Lastec's footprint remains small compared to more-established national brands. What it has going for it, however, he insists, is the ability to cut grass better on real-life properties — properties with hills, bumps, depressions, uneven terrain — better than fixed-deck units. And, he predicts, once commercial cutters see what his units can do, Lastec's articulating-deck models (decks ranging from 61- to 86-in. cutting capacity) will take their place as standard equipment on landscapers' trucks.



The Articulator 2886AD follows a site's contour for better cut, no scalping.

The Articulators, with multiple decks and blades that flex and contour with the ground, have virtually replaced wide-cutting, fixed-deck mowers in the golf industry, says Laskowski. Why shouldn't they do the same in the commercial market?

— Ron Hall

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Circle 126

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sound option than conventional or reformulated gasoline.

"My crews are no longer coming in contact with gasoline," Morrell says. "That's one less carcinogen in their lives, and that is good for everybody."

Making the transition

When it first moved to propane in 2002, the AISD found it necessary to experiment and tinker with the mowers to make the transition successful. Today, manufacturers like Dixie Chopper, Ferris, Envirogard and others produce or plan to roll out propane-fueled ZTR mowers. Envirogard (**www.envirogard.com**) and other companies manufacture conversion kits for older mowers, helping to alleviate the expense of transitioning a whole new fleet.

The propane cylinder itself has even been improved through experience in the field. In the beginning, Morell and other early adopters were using cylinders designed for use of forklifts, which don't often travel over rough terrain, resulting in fuel-delivery problems and frozen lines. Now, however, mower-dedicated cylinders effectively regulate the flow of propane to the engine, even on the roughest terrain. The mower-dedicated cylinders are engineered to be rugged, easily transportable and connected in seconds.

The idea of switching to a seemingly new, less-established fuel like bio-diesel or ethanol can be worrisome as there is not an existing supply infrastructure. The same is not true of propane, which boasts of a well-established delivery infrastructure. The supply of propane for a mower fleet is easily secured, requiring either the delivery of a bulk tank that is regularly filled by a bulk supplier or the delivery of pre-filled cylinders on an as-needed basis.

Won over

Billy Morell is no longer a skeptic. The environmental, cost and maintenance benefits inherent in a transition to propane fuel have won him over.

"Propane is superior," says Morell. "Were making more buys every year, and everything will either be propane-fueled right off the assembly line or we'll convert it here if we have to." LM

— The author is vice president, corporate development for Ferrellgas. Find out more at **www.ferrellgas.com**.

BIGMOW, the newest robotic mower

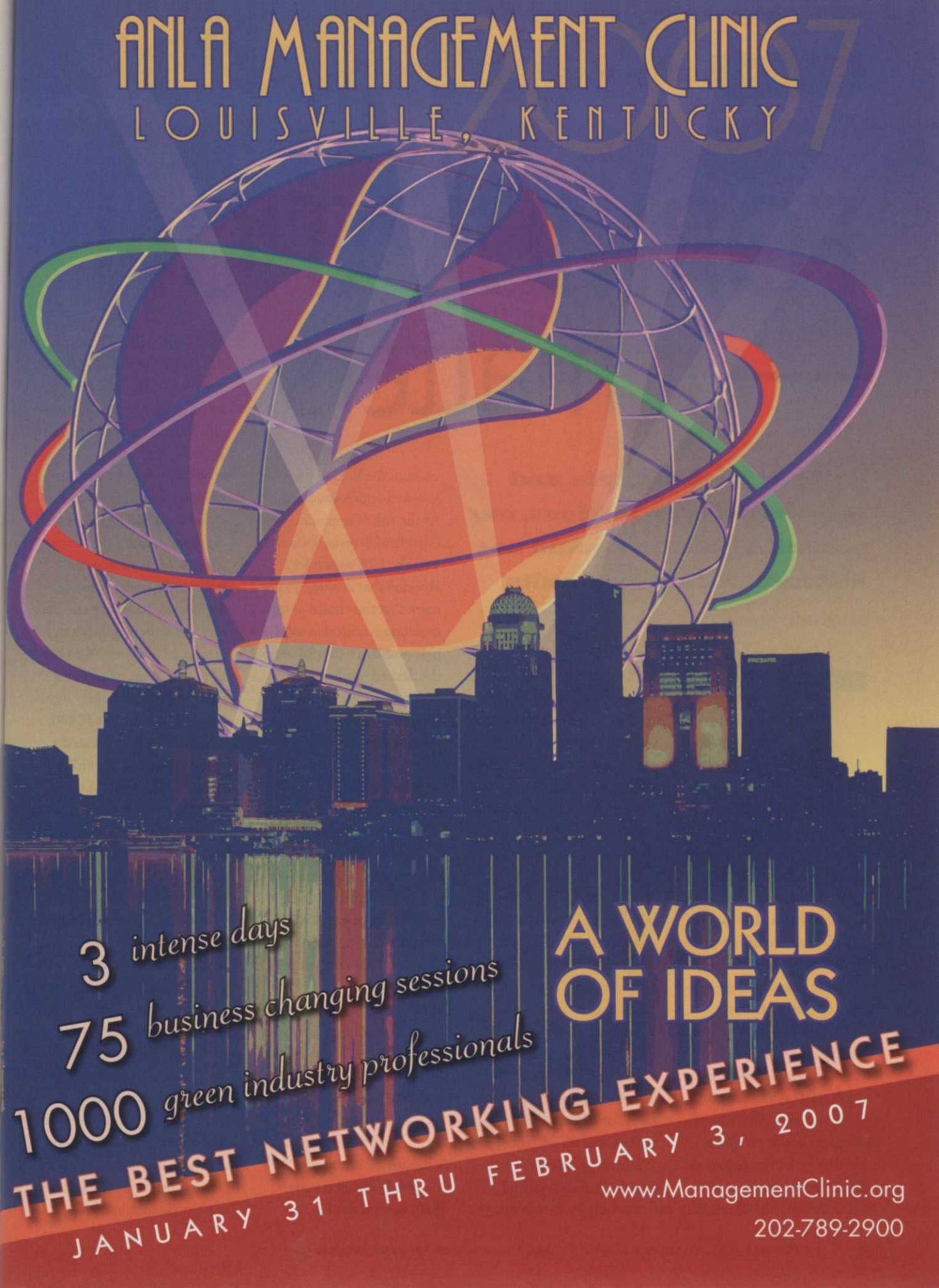
Are the professional grounds and landscape markets ready for a robotic mower? Tom Moore of SofTee Automation, a North Carolina-based distribution company, thinks they are. He showed off the BIGMOW, 5-acre robotic mower at this past fall's OPEI Expo in Louisville, KY.

This unit, manufactured by Belrobics in Belgium, has five floating cutting heads with a combined 42-in. mowing width. The battery-powered unit cuts continuously as its onboard computer mows in a random or a systematic pattern. It uses sonar to detect trees and signage in its path, says Moore. When low on energy, the unit goes back to its recharging station for a 90-minute charge. Then it's out mowing again. A buried low-voltage wire defines the perimeter, beds and islands. Because the unit is continuously mowing, bagging clippings is eliminated.

This futuristic, battery-powered robotic unit mows continuously.

Moore says the unit is particularly suited to sites such as hospitals, office complexes, nursing homes, educational facilities, restricted areas and public building grounds. For more information visit **www.bigmow.biz**.

— Ron Hall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FORMULATION — it matters

Without effective, safe and easy-to-use formulations, our pesticide products could not deliver satisfactory results

BY RON HALL / Editor in Chief

Turf and landscape care providers often overlook the importance of formulation in the effectiveness of the pest control products they choose and use. A formulation is a mixture of active and inert ingredients that make a pesticide more convenient to handle, safer and easier to apply. The inert ingredients are usually solvents or carriers.

It's easy to focus on the active ingredient (a.i.) and neglect to pay sufficient attention to formulation and how that too figures into solving particular plant health problems, whether for turf or ornamentals. Pesticide manufacturers spend well over $100 million in discovering, testing and preparing a new a.i. for the market. The process takes a decade, usually more. Early in the process, they begin investigating the best way to maximize the effectiveness, safety and delivery of that a.i. to the pest — a formulation. And while not as "glamorous" as the development of the active, formulation development involves its share of sophisticated science, too, not to mention regulatory oversight and end user acceptance.

In a broad sense (and because the Super Bowl is just weeks away), let's liken the relationship between a.i.'s and formulation to that of a quarterback and his offensive line. While the quarterback is the guy charged with making things happen, he can't do it without the help of his usually less-well-appreciated linemen. At the risk of reminding Cleveland Browns' fans of the wretched '06 season let's abandon that analogy and remark that the choice of formulation is critical in solving a pest problem and achieving the desired result.

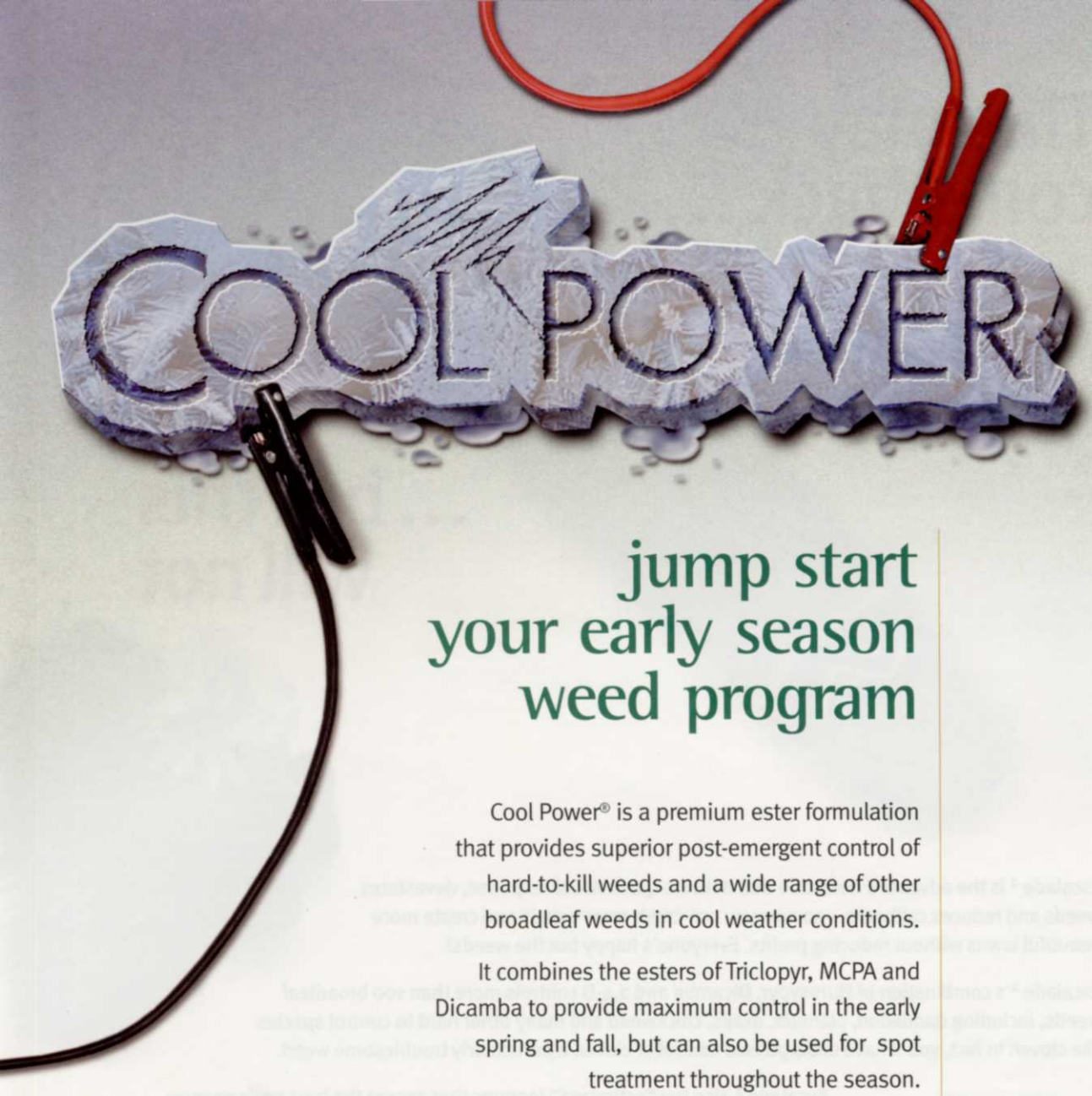
The selection should be based on the pest's habits, environmental and weather conditions, mode and ease of application, spray drift or runoff concerns and, in some cases, regulatory requirements.

Here are formulations commonly used in the professional turf and ornamental market:

- **Soluble concentrate (SL):** water soluble a.i. mixed with water and a surfactant or penetrant.
- **Suspension concentrate (SC):** water insoluble a.i. ground to a certain particle size and dispersed in a stable suspension.
- **Emulsifiable concentrate (EC):** a.i. dissolved in organic solvent and forms an emulsion when added to water.
- **Emulsifiable oil in water (EW):** water insoluble a.i. ground to a certain particle size and dispersed in a stable suspension then blended with an oil or may be an oily pesticide blended into a stabilized aqueous suspension.
- **Wettable powder (WP) and soluble powder (SP):** water –soluble packaging that when dispersed forms a solution or suspension of a.i. in water.
- **Water dispersible granule (WG/WDG):** granules to be applied after disintegration and dispersion in water. There can be a wide range of a.i. in the granular product range.
- **Spreadable granule (G/GR):** a.i. coated or incorporated onto a spreadable granule.
- **Granular bait (GB):** a.i. coated or incorporated on a granular designed for use as a bait attractant for target pests.

Formulation technology has progressed light years in the past 10 to 15 years, resulting in a greater variety of formulations available to lawn care and landscape pros.

Applicators, whether they fully appreciate it or not, benefit from formulation technology. Advancements in formulation give them more pest treatment options as well as increasing the utility of pest control molecules and giving new life, new uses and adding value to older chemistries. LM



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