

Mowers: 60 Years Of Changes



One of the original 50 reel mowers produced by Locke Steel Chain Co. in 1930. Locke president Tom Herrman still uses it.

Picture mowing a fairway or athletic field in the early 1920s. You see two basic types of mowers, a walk-behind reel mower (with or without an engine) and a gang of ground-driven reels pulled by an agricultural-type tractor. The walk-behind provided a fine cut and the gang an acceptable utility cut. Many of these mowers had to be altered by the greenskeeper or ground-keeper to suit his needs.

Ten years before it was common to see a horse pulling a gang of reels across a golf course or park. Power in the form of agricultural tractors and even washing machine engines enabled many turf managers to turn their stables into maintenance buildings. A small group of inventive machinists went to work to take the mowing industry off hay and onto gasoline. They had some idea how to go about making these changes since a British company called Ransomes, Jefferies and Sims had powered models on the market in Europe.

Beginning in the late teens and '20s, the foundation of the gasoline-powered reel mower industry was established. National Mower Company, Locke Manufacturing and Jacobsen started producing powered walk-behind reel mowers. Worthington Mfg. Co., which had been manufacturing reel gangs for horse-drawn mowers, National and Toro developed tractors with reels suspended from the sides and below to provide the kind of maneuverability needed on golf courses and other large turf areas. Reel gangs, however, continued to play a large role in mowing large turf areas for decades to come. Worthington, Toro, Jacobsen, Ransomes, Roseman, National, Brouwer, and Jerry Clipper still produce reel gangs today.

Now picture mowing the same areas today. The walk-behind, reel gang and tractor mowers are still there, in modernized versions, having survived the test of time for more than 60 years. Today, the reel gangs are used on golf course roughs and

large areas around fields on university campuses and park grounds. The walk-behinds, many with grooming attachments on the front, are found on golf and bowling greens, croquet courts, grass tennis courts and smaller areas of fine turf. Riding reel mowers up to 15 feet in width mow entire golf courses, parks and campuses in a single day.

A little closer look, however, will reveal an entire generation of rotary equipment, a budding fine-cut flail mower market, low-slung four-wheel-drive tractors with interchangeable attachments and widespread use of hydraulics. Maneuverability, speed and efficiency far exceed those of the '20s. Some mowers even sport digital gauges that provide exact information important to operation and maintenance. Mowing today is a far cry from hooking up reel gangs to a horse's harness and snapping the reins to get the horse to walk.

While reel units were the first type of

professional mowing equipment, rotary units developed in the early '50s assumed a substantial position in the turf market by the late '70s. Established largely by Goodall (now Bunton) and Whirlwind (now Toro), the commercial rotary mower rapidly gained acceptance for areas where a fine cut was not essential. It had no reels or bedknives to grind, was highly maneuverable and was easy to service and maintain. It was also simpler to manufacture.

Jacobsen took a strong position in the commercial mower market in the '50s when it bought Worthington and later started manufacturing rotary mowers. It was the beginning of a major competitive battle between "Big Red" (Toro) and "Big Orange" (Jacobsen)—a battle that has played a major factor in the growth of the commercial and professional mower market.

Goodall charted new waters in rotary mowers when it introduced a 36-inch, self-propelled walk-behind in the early '60s. By incorporating brakes on the two drive wheels, Goodall was able to build a wider, heavier mower with good maneuverability. It also brought the concept of zero turning radius to the industry. The operator could turn the mower, much like a Caterpillar tractor, by applying the brake on one wheel while the other wheel continued to turn.

These concepts of maneuverability, large size and zero turning radius were also applied successfully by Gravely, Exmark, Kees, Toro, Snapper, Wisconsin Marine (now Ransomes), Yazoo and other companies. Oddly enough, these large, walk-behind mowers did not achieve great commercial success until the early '80s. Today, walk-behind rotaries stretch up to 60 inches wide. Sulkies can be attached to them to provide an inexpensive riding mower. Jacobsen, John Deere, Scag and Lesco have since joined the group.

Excel, a manufacturer of tractor cabs, had bigger things in mind and took rotary mower size and maneuverability a step further. Rather than turning a small garden tractor into a mower by suspending a rotary deck from its belly, Excel redesigned the drive unit so that the deck could be mounted in front. The company also invented a steering mechanism consisting of two levers and independent drive on the front wheels so the mower could actually spin around in one location. After a little practice, the operator could guide the front-mounted deck along curving walkways and around trees without slowing down. The deck could also be removed and replaced with a snowblower or plow blade.

In 1965, Excel added a larger engine and a 72-inch deck to cut mowing time in half and nearly eliminate the need for trim mowing. Finally, the company replaced mechanical drive to the independently front wheels with hydrostatic drive. In 1983, Excel boosted horsepower further to add cutting decks on the side of the drive unit called Range Wings. Now, a single rotary tractor could cut a swath 15 feet wide, the same width as large, reel gangs.

Howard Price, Jacobsen, Ransomes and Toro have adopted similar technology and added hydraulic drive to the cutting decks. Hydraulics are also used to lift the side decks when necessary. Many of these principles were quickly applied to tractor reel units at the same time.

Out-front, riding rotaries today are available from a number of companies, including Bunton, Cushman, Deines, Howard Price, Ingram, Jacobsen, John Deere, Gravely, Kut-Kwik, Lesco, Middlesworth, Scag, Toro, Yazoo, and others. In the mid-'70s a small, family-owned company in Ohio developed a small turf tractor to resemble the latest large agricultural tractors. To retain maneuverability and to pull farm implements on soft or wet fields, ag equipment companies had introduced four-wheel drive tractors that were hinged in the center. These articulated units had tremendous traction and could turn in half the space it took a conventional tractor. Once the Steiner Corp. had successfully miniaturized the farm

tractor, it began adding a wide assortment of attachments, including front-mounted rotary and reel mowing units, broom, edger, scoop and blower. Like its big brother, it can also pull implements. The Steiner family was satisfied with its small share of the market which grew largely by word-of-mouth. That may be changing since Ransomes, Sims and Jefferies, the British parent company of Ransomes, Inc., purchased Steiner Corp. last month.

Hydraulic drive and using one tractor or drive unit to power a variety of attachments forced turf equipment engineers to take a closer look at hydraulics. It takes more horsepower to drive hydraulic devices than it does mechanical ones. However, hydraulic drive will allow infinitely variable speed for both the tractor wheels and for the attachments. It also enables manufacturers to eliminate belts and pulleys and their adjusters.

A hydraulic system consists basically of a pump, powered either by the tractor

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John Deere's 3325 Pro Turf Mower cuts a 138-inch swath as low as 3/8 inch. Instruments monitor 12 different operating functions.



The Metrac 3003K from Lely is a highly flexible prime mover that can operate attachments on both front and rear. The low-profile machine has four-wheel drive and steering.



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engine or PTO, that circulates oil under high pressure in hoses to small motors located on the devices to be driven. Valves regulate the pressure and flow rate of the oil in hoses thereby determining the speed of the motor. Dirt or debris in the oil can harm the components, so a filter in addition to regular cleaning and maintenance are important.

Companies like National have chosen not to use hydraulics, preferring instead to provide mowers with smaller engines, lower cost and simpler from a maintenance standpoint. Other companies, such as Excel and Brouwer, utilize hydraulics for hydrostatic drive and lifting attachments but not for driving attachments. Many manufacturers offer models with different combinations of mechanical and hydraulic drive.

"Hydraulics are here to stay," says Helmut Ulrich, product marketing manager with Toro. "The operator has more confidence in hydraulics than he did four years ago. Manufacturers have made hydraulic "prime movers" simpler to service and more reliable. With hydraulics you can precisely match forward ground speed to the speed of the reels."

Tom Carter, vice president of Jacobsen, has been one of the pioneers in hydraulic mowing equipment. "Hydraulics have greatly increased the versatility of turf equipment," he explains. "The operator has more control than he has ever had." Carter admits that mechanics must be trained to maintain and repair hydraulic units, but once that hurdle is cleared, the units provide greater flexibility with no more maintenance than mechanically-driven units.

Both Carter and Ulrich used the term "prime mover" frequently. The term is proof that manufacturers are heading toward multi-use tractors or drive units. Prime movers that can drive reel, rotary and flail mowing attachments will also be used for verticutting, aerating, vacuuming, blowing, brushing and more. As manufacturers expand the usefulness of mowing tractors, they are also introducing all-purpose prime movers. Examples of these are the low-slung, four-wheel drive, four-wheel steering tractors currently available from Bunton, Jacobsen and Lely. They can drive attachments in front or in the rear and have excellent stability on slopes. The Steiner articulated tractor, and Brouwers' new four-wheel drive tractors are smaller versions of all-purpose prime movers. Kubota introduced a four-wheel steering mowing tractor in 1986.

As turf standards change, so must mowers. When Sylvanus Locke built his first triplex reel mower in 1928, he had no idea that the triplex would set the standard for fairways and stadium fields 50 years later. In fact, it wasn't golf courses he had in mind when he designed it. He was thinking of large estate lawns and that was its primary use in the U.S. He didn't realize the potential the mower had for sports turf. When Tom Herrmann purchased Locke in 1987, he

Scag's commercial walk-behind rotary mowers cut up to 61 inches wide.



The Excel Hustler Range Wing mower can cut 60 acres of turf in an eight-hour day.



The Steiner tractor articulates in the center and features four-wheel drive. It can support a wide range of attachments both front and rear.

quickly discovered that the mowers were being used in Europe primarily for sports fields.

In the '70s, Jacobsen, Ransomes, and Toro introduced lightweight triplex greens mowers to reduce the time it took golf course crews to cut the greens in the morning. As prestige courses started raising the standards for fairways, the triplex began to spend more time on the fairways than on the greens. Superintendents were impressing club members with the striped, sharp-edged pattern imparted on the fairways with the mowers. At the same time, the lighter weight triplex caused less compaction and allowed the superintendent to pick up clippings, both factors in reducing populations of annual bluegrass on fairways. The mowers grew in importance as fairway cutting heights shrunk to the half-inch mark.

Light-weight mowing had been born and the triplex, and later larger light-weight units, were the mowers of choice. The golf course mowers started finding their way into professional and university stadiums across the country. The mowing pattern in the outfield of baseball fields and between the five-yard lines of football fields has also become the standard for stadiums.

The trend was good news for Locke and National, that had been making triplex and five-reel mowers since the early '30s. Lesco introduced its first triplex in 1986.

Changing standards for greens are having



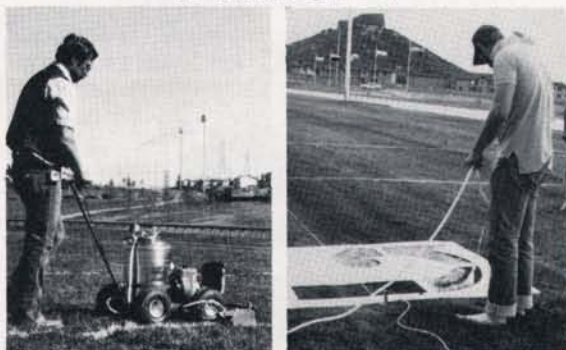
Three-wheel drive provides improved traction and maneuverability for Jacobsen's Tri-King 1471 triplex reel mower.

a big impact on greensmowers. As golfers wanted greens on their course to be as fast as those seen during championships on television, the superintendent had to respond. At first he tried lowering the height of cut and topdressing with sand to make the golf

ball roll faster and further. He verticut the greens lightly and frequently to remove excess tillers and thatch that could slow the ball down. These maintenance practices were not only time consuming, they were

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stressful to the bentgrass, bermudagrass or overseeded ryegrass. The superintendent needed a device that would enable him to speed up his greens without creating additional stress.

It took Larry Lloyd, an inventive California superintendent, to come up with the answer, a grooming device attached to the front of the greensmower. Not only did the device remove the tillers, stems and thatch during mowing, it stood the turf up so it could be cut as evenly as possible. He found that he could reduce verticutting, let the grass grow higher and thus healthier, and eliminate much of the grain on the green without slowing down ball roll.

Jacobsen bought the rights for the groomer from Lloyd and began offering the device in 1986. It consists of vertical blades positioned to slice turf and vegetation raised up by a grooved, crimping roller. "It's not a verticutter as we know it," explains Carter. Recently, Bunton, Deere, Lesco and Toro have developed their own versions of a groomer for their greensmowers.

The next step for mowers is advanced control, predicts David Legg of Ransomes, Inc. Digital read-outs will tell the operator information critical for operation and maintenance. Reel mower operators will be able to know what speed the reels are turning in addition to ground speed. They will be able to check an entire list of engine and



Brouwer powers the reels on its seven-gang with the tractor PTO but uses hydraulics to raise and lower them for transport.

equipment conditions to gauge performance and efficiency.

Most importantly, says Jacobsen's Carter, the control system will warn the operator of problems immediately so that they can be corrected before damage to the equipment takes place. A multi-function check system will tell the operator when maintenance is needed so that the mower can reach its maximum life and productivity.

Greater flexibility, closer control over cutting conditions and increased efficiency have changed and will continue to change mowers for sports and utility turf. Indications are that refinements of existing technology will

be coming rapidly in the next five years. They will be primarily in the tractor or drive unit. As the horse was replaced by the first tractors earlier in the century, the tractors we know today will be replaced with "prime movers".

"We may mow turf with lasers in the future," says John Kinkead, president of National Mower Company. But for the moment, manufacturers are testing fine-cut flails to serve as a type of intermediary between reel and rotary. Reels still provide the best cut with the least amount of energy. Increasing efficiency without sacrificing quality remains the driving force behind the industry.

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