

The Cutting Edge on Reel Versus Rotary Mowers

by Nolan Meggers

There's no grass that is ideal for all athletic field applications and no one mower that's perfect for all mowing situations. Mower selections must ultimately deliver the desired cut quality at the desired turf height. No matter what great features the cutting unit offers, if it doesn't deliver a cut that consistently meets standards, the mower will be unacceptable.

Different grasses and different cultivars of the same grasses have varying tolerances to mowing. The blades of some grasses are easier to cut cleanly than the more fibrous blades of other grasses. Creeping, stolon-producing grasses, such as Bermudagrass, tolerate close mowing. However, more upright growing grasses, such as bluegrasses and ryegrasses, need higher mowing heights to thrive.

Another consideration is leaf texture. Fine-leaved grasses, such as certain Bermudagrasses and bentgrasses, can be mowed shorter than grasses having coarse leaf texture, like turf-type tall fescues. The height of cut should be determined by the natural growth pattern of the specific grass variety (physiological characteristics), the form and structure of the specific grass cultivar (morphological characteristics), and the role the grass has to play.

Whatever the turf cultivars, the "one-third rule" is recommended. This means cutting no more than one-third of the grass blade at any one mowing. For example, hybrid Bermudagrass may have a suggested height of cut ranging from 1/4 - 1 in. Therefore,

mowing should take place when the grass reaches a height of 3/8 in. for the 1/4 in. turf, and a height of 1-1/2 in. for the 1 in. turf. Kentucky bluegrass varieties with a suggested height of cut of 2 in. should be mowed when the grass reaches a 3 in. height.

Turf top growth helps insulate the growing points from temperature extremes. Excessively warm temperatures can drive a cool-season grass to dormancy. Temperatures that are too

positioned on the reel at an angle, and move across the stationary bedknife in a scissors-like action to produce a clean cut.

Rollers are positioned at the front and back of the cutting reel. Front rollers pass over the turf prior to mowing. These can be solid, grooved or spiraled. Optional roller scrapers can be used for cleaning the rear rollers to maintain a more consistent height of cut.

Reel mowers use individual cutting units that contain one reel per unit, and they can combine multiple cutting units to cover a wider expanse of turf. Generally, walk-behind reel mowers will have a single cutting unit, whereas ride-on reel mowers may have one or multiple cutting units. Many options are available in reel mowing units to meet individual needs while providing consistent cut quality.

A reel mower with properly sharpened blades gives a more precise, manicured-cut than a rotary mower. When the reel is powered at a consistent rate in the pre-set reel-to-bedknife position and the cutting unit is properly positioned for the ter-

rain, the mower produces a high-quality cut.

The cutting units should offer the option of being placed in fixed or floating position. The fixed position provides an even cut for flat turf conditions, while the floating position allows the mower to adjust to uneven terrain. The reel power source should be able to deliver consistent power under a variety of mowing conditions.

To attain the desired clean-cut precision, reel cutting units should be



A rotary mower clips Casey Field in Covington, VA.
Courtesy: Allen Dressler

cool will curtail the growth of warm-season grasses. Top growth also serves as a protective cushion against wear and traffic damage for grass growth points, which is always a factor on high-use athletic fields.

The Reel View

Reel mowers have fixed blades, which are part of a turning cylinder (reel) that moves down and back against a stationary bedknife at the base of the mower. The blades are



A walk-behind reel mower helps prune the field at Milwaukee County Stadium. Courtesy: David Mellor

easy to adjust in small increments of 1/16 - 1/8 inch within a range of mowing heights. On reel mowers, the cutting height is measured from a flat, solid surface to the edge of the bedknife. Reel mowers offer an option in the number of blades on the reel. Generally, the lower the desired height of cut, the greater the number of blades to the reel. For example, to maintain turf above 1 in., use five blades; for 1/2 - 1 in. turf, use six blades; and for turf maintained below 1/2 in., use seven or eight blades.

Reel mower cutting units may be quickly detached from the traction unit so that reels can be checked or ground, and adjustments can be made. Optional

backlapping valve attachments allow sharpening in place, right on the mower.

The Rotary View

A rotary mower has one or more horizontally moving, high speed blades that operate within the mower deck. The sharpened tips of the blades cut the grass by impact. On rotary mowers, the blades' function is not only to slice bits of grass with the two sharpened tips of the blade, but to create a vacuum within the mower deck. This pulls the grass up for an even, clean cut. Where material discharge is desired, the mower must generate sufficient clockwise blade rotation to move cut material to the discharge chute.

The addition of second and third blades within the mower deck allows the rotary mower to cut a wider swath. With a two-blade deck, the two blades must overlap. One blade is set further in from the drive wheel, while the other remains positioned with the drive wheel to facilitate discharge, as in a single blade mower deck.

In large-deck mowers with the three-blade configuration, the middle blade is set out to the front of the deck with the other two blades close to the right and left drive wheels. The closer the blades are to the drive wheels, the smoother the circle cut around a landscape feature will be. Each blade takes its series of bites. Horsepower



Reel mowers designed these eye-catching patterns at Milwaukee County Stadium. Courtesy: David Mellor

requirements increase as the bite size increases. Foliage removed by multiple-blade decks must move a greater distance to be discharged from the mower deck. This also requires additional horsepower.

On rotary mowers, engine speed controls the blade speed. The faster the mower moves forward, the larger the size of the bite taken. Lift can also vary with the type of blade used. Some blades have very little lift, while others provide a large amount and create a tremendous vacuum or pulling action. Some mower decks have the option of changing blades to fine-tune the cutting and vacuum. With mulching mowers, or mowers with the mulching option, the lift action of the blades and other mower features allow the blades to cut and re-cut the grass several times. The small sections of cut grass filter into the turf to decompose. With all these available options, model selections should meet turf care needs while providing consistent cut quality.

The rotary mower deck must follow the contour of the ground in order to put the blades in proper contact with the grass. With large-deck mowers, the wheel placement and the flexibility of motion should allow the deck to move or "float". Mowers must respond to the contour of the terrain by moving both vertically and from side to side. This avoids scalping grass and leaving uncut grass on one side of the mowing swath.

Correct set up and leveling of the rotary mower deck are extremely important for proper performance and

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good cut quality. With improper conditions, lift is reduced and too much of the blade comes in contact with the grass. Cutting height options should range from the lowest to the highest recommended heights for the grasses the mower will cut. The easier it is to adjust mower deck heights, the more frequently the adjustments will be made. On rotary mowers, the cutting height is measured from a flat, solid surface to the cutting edge of the blades.

In general, rotary mowers are better for higher cutting heights. They are more versatile, are better able to adapt to rough conditions, they can handle tough grasses, and they chop clippings for recycling. Further, rotary mowers are usually simpler mechanically and require less skill to operate and maintain than reel mowers.

Putting Mowers to Work on Sports Turf

Sports turf managers must match mowing frequency and height of cut to

the unique conditions of their fields. Variables include natural growth patterns of the grasses, weather conditions, the type of sports that will be played, the timing and intensity of use, and the type of mower used. On the highly maintained, irrigated fields of professional sports, seasonal changes may require only minor adjustments. Greater adjustments may be required on the practice and game fields of sports complexes, schools, and park systems when the turf is subjected to heavy wear in less than ideal conditions. Mowing decisions affect turf health, density, playability and grass variety dominance.

In southern regions, hybrid Bermudagrass may have a suggested height of cut ranging from 1/4 - 1 in., while common Bermudagrass can range from 1/2 - 1-1/2 in. In the northern transition zone, a Bermudagrass cutting height above 1/2 in. may produce a surface too loose and spongy for adequate footing. The cool-season grasses, bluegrass, perennial ryegrass

and turf-type tall fescue, have a suggested cutting range of 2 - 3 in.

For cool-season grasses, the ideal temperature ranges from 60 - 75F; for warm-season grasses the range is from 80 - 95F. When temperatures at grass growing points are above or below these ranges, growth slows or stops, and the turf goes into a period of dormancy.

Mowing is an important part of the art and science of sports turf management. Sports turf professionals must develop mowing strategies to fit their specific fields and conditions. □

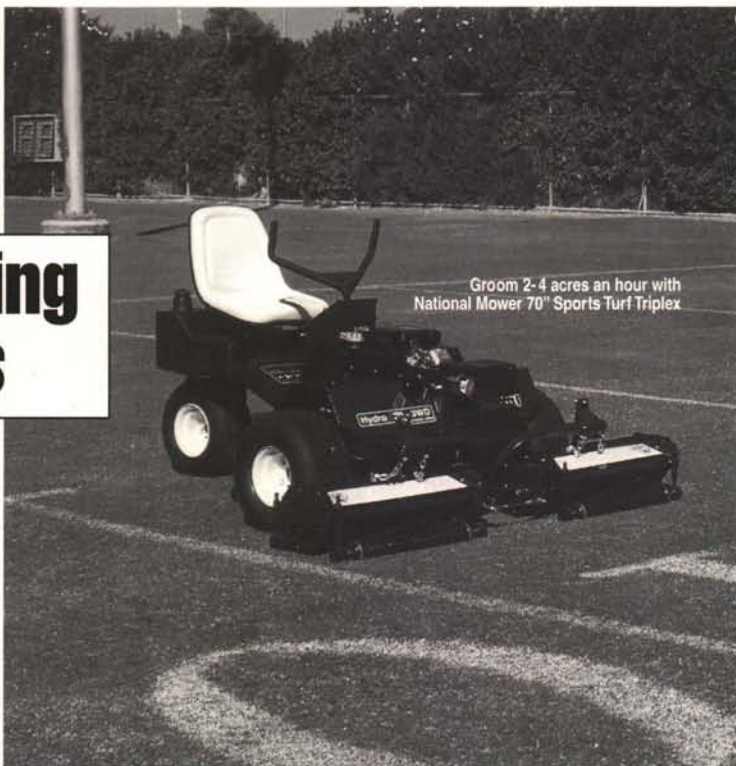
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