Drop Spreaders

Drop spreaders generally have a long, narrow hopper. Material is fed to a series of openings that stretch along the base of the hopper. The material is agitated and channeled to the openings by the projections or blades attached to a shaft that turns with the motion of the wheels. A plate at the base of the hopper is manipulated to control the size of openings and thus the amount of material to be discharged through each one.

A drop spreader delivers a uniform amount of material across the width of the openings. The speed at which the spreader travels, the consistency of that speed, and the type of terrain, all contribute to the overall uniformity of application.

Because the hopper is placed between the spreader's wheels and material is spread directly from the openings at the hopper's base, it's necessary to overlap each swath for even coverage. Too much or too little overlap will result in too much or too little material being applied to the overlap areas. On some drop spreaders, the operator makes the calculations to calibrate the correct discharge opening setting and monitors the material application. On other drop spreaders, the area to be covered and amount of material to be distributed are fed into a mechanical control unit that automatically calibrates the settings and monitors the rate of material distribution. These systems alert the operator of uneven coverage that may be caused by erratic ground speeds, terrain fluctuations or equipment problems.

Drop spreader sizes range from 24 inches up to 12 feet or more.

Broadcast Spreaders

Broadcast or rotary spreaders generally have a taller, circular or conical shape. Material is channeled to an opening or a series of openings at the base of the hopper by a centrally mounted, single- or multiple-armed agitator. The agitator may spin in a clockwise or counterclockwise motion. The material is fed through the hole or holes onto an impeller that has a surface pattern of spines or ridges. The shape of the impeller and design of the ridge pattern combine to contribute to the trajectory the material follows as it is channeled from the impeller to the ground.

The material moves out from the broadcast spreader's impeller to the area ahead and to the sides of the hopper, in fan or modified bell pattern, creating a wider swath than that of drop spreaders. Normally, material distribution is heavier close to the spreader and lighter further from the spreader. The swath area and pattern and the distribution of material within the swath differ according to the spreader design and size. Spread pattern width can range to 40 feet or more. The agitator, number and placement of discharge holes, and shape and ridge pattern of the discharge plate combine to affect the uniformity of material distribution.

Selecting spreaders isn't an easy process, but making the right match will pay off in increased accuracy, speed and efficiency.

As with drop spreaders, the size of the discharge opening or openings can be manipulated to control the rate of material flow. Broadcast spreader models with multiple discharge openings also offer the option of closing some of the holes to block delivery of material to one or both sides of the application pattern. There are also special optional attachments for some models that block flow to one side of the application pattern.

The speed at which the spreader travels, the consistency of that speed, the fluctuations of the terrain, and the speed and direction of the wind all combine to affect the uniformity of material delivery. Again, the swath pattern must be overlapped to achieve uniform application.

Broadcast spreader calibration and monitoring can be controlled by the operator, mechanized equipment, or a combination of the two methods.

Pendulum Spreaders

Pendulum spreaders usually have cone-shaped hoppers. Material is channeled to a discharge spout located at the base of the hopper. As with broadcast spreaders, a single- or multiple-armed agitator stirs the material and sends it toward the surface of the opening. As the spreader travels, the spout swings back and forth distributing material over a swath that may range from quite narrow to 40 feet or more. Different-sized spouts are offered to accommodate materials in varying sizes and densities, from fine seed to fertilizers to de-icers, and to control the width of the swath. Agitator extensions may be available to ensure proper movement of fine materials such as powdered fertilizers, salt or sand.

Material distribution is generally heavier in the center of the swath, lighter at the outside edges. Again, overlap is necessary for uniform application. Calibration and monitoring may be controlled by the operator, by mechanized equipment, or by a combination of the two.

Factors for Consideration

Spreaders may be operated in conjunction with tractors, all-terrain vehicles, utility vehicles, and more. Specific requirements for proper operation vary with the individual spreader.

Depending on the sophistication of any mechanized spreader unit, the operator may watch a monitor for signals that ground speed is erratic and make appropriate adjustments, or material application rate may be adjusted automatically to compensate for changes in ground speed or terrain.

Spreader components vary with the size and complexity of the unit, the expectations for its use, and the adaptability of certain materials to the design of a particular model.

Hoppers may come in painted steel, epoxy-coated metal, galvanized steel. stainless-steel, polypropylene, or fiberglass. Material at the base of the spreader may be polypropylene, steel, galvanized steel, stainless-steel, cast-iron or nylon. Agitators may be steel or cast-steel. Tubing may be epoxy-coated metal, steel or stainless-steel.

Materials are basically chosen for their ability to withstand corrosion, their strength and durability, and their resistance to shock, heat and cold.

Design features such as the choice of bushings and axle bearings, the method of enclosing the gears, the size and type of wheels, the operational characteristics of the calibration unit, and the linkage system can increase efficiency and reduce maintenance time.

As every spreader operator quickly learns, little things make a big difference. For example, with push spreaders the ability to adjust the handle height, shape and comfort of the handle grips, and the

continued on page 12

Fertilizer Spreader Selection
continued from page 11

placement and ease of on-off, and calibration adjustment devices can lessen fatigue and shave a few valuable minutes from each use.

With the projected needs identified and an overview of the available spreader options, it's time for the third step: reviewing features in light of the benefits they can bring to the specific tasks.

What are the specific features required? Review the materials to be applied and the areas to be covered. Which spreader type — drop, broadcast or pendulum — will deliver those materials most accurately and uniformly in the shortest time with available personnel? What swath width and pattern variations will be necessary? How important is hopper capacity? Are a wide range of calibration choices needed?

How easy is the spreader to transport? With multiple sports fields or lawn areas, spreaders may need to be loaded and unloaded from trucks or trailers many times a day. Can larger units remain attached during the move from one area to another? Will the time saved with a faster, powered unit balance the time the tractor or utility vehicle could be used for other projects?

This proliferation of products provides options that allow the turf manager to match equipment to the specific needs of the facility.

What are the skills and efficiency levels of potential spreader operators? Will crew members with push spreaders retain the necessary degree of accuracy when application rates, terrain and weather conditions vary? Will complex units require specially trained operators?

How do budget considerations affect selection decisions? With limited funds available, will spreader versatility be more important than the speed and efficiency at which a specific task can be completed with a more specialized unit? Will more complex models or additional attachments extend spreader use enough to compensate for a higher initial cost? Will manual or power equipment-connected spreaders be more cost-effective?

What spreaders are you currently using? Will more spreaders of the same type and size enable crews to complete work more quickly and efficiently? Will a spreader of a different size and delivery method better augment existing equipment? Is a certain task repeated frequently enough to justify selecting a spreader with specific features designed to complete that task more efficiently?

How sturdy must the spreader be to fit the job? What's the anticipated life of the spreader? What maintenance and repairs will be anticipated? Are parts and service easily attainable?

Selecting spreaders isn't an easy process, but making the right match will pay off in increased accuracy, speed and efficiency. ❑

Editor's note: Steven and Suz Trusty are partners in Trusty & Associates in Council Bluffs, IA. Steve is an assistant chair of the Sports Turf Managers Public Relations Committee.

UNIFORMITY OF DELIVERY: BEYOND WHAT'S IN THE BAG

Uniformity of delivery is what spreaders are all about. Major innovations — alterations of form, construction materials and delivery apparatus, precision calibration devices, metered monitoring and control — all aim to ensure that material is applied as accurately and evenly as possible.

Besides the variables of equipment selection, cleanliness and maintenance, operator efficiency and consistency, type of terrain, and weather conditions, the material to be applied comes under scrutiny. Tests conducted by Agronomy Professor Dr. Keith Karnok of the University of Georgia in Athens, GA, in the late 1980s centered on the different fertilizer formulations had on the uniformity of material dispersement.

With blended or mixed fertilizers, nitrogen (N), phosphorus (P) and potash (K) are incorporated on different carriers that are then combined in the proper proportions to create the desired total formula. Homogeneous fertilizers incorporate the desired ratios of N, P and K on each particle.

Testing compared the results of applications of various types of blended and homogenous fertilizer formulas.

Initially it might appear that all blended products would by nature be less uniform in their delivery of N, P and K than the homogeneous materials. However, Dr. Karnok reported that where fertilizer blends were uniform in particle size and density, good distribution was achieved even if N, P and K were incorporated on separate granules.

Where blended materials contained wide ratios in size and/or density, individual particles were segregated out in the spreading process. Heavier particles moved further from the spreader source, while lighter particles didn't travel as far, tending to concentrate closer to the spreader — which meant that the different nutrients were unevenly dispersed.

According to Dr. Karnok, looks were sometimes deceiving. A blended material that initially appeared fairly uniform might not spread as well as another material that appeared less uniform. Particle size and density combined to determine uniformity of distribution.

"Other factors appear to be more critical than the fertilizer formula in spreading fertilizers easily," Karnok said. "Accurate spreader calibration, operator control, proper and consistent speed, the terrain, the cleanliness and maintenance of the spreader, all play major roles in uniform application. If everything else were done accurately, the material itself — a homogeneous material or a blend with uniform particle size and density — would be more of a factor. Uniformity of distribution would also be an issue to consider with combination products such as the incorporation of herbicides or insecticides with fertilizer."

With the time, money and effort expended on achieving the desired results, it just makes sense to shoot for the highest degree of uniformity when spreading material.

Turf Weeds: Preventative Control Crucial

By Tom Vrabel, Ph.D., and Laurence Mudge

Controlling hard-to-handle weeds is a common problem among turf management professionals. Fortunately, there are a number of options available that can provide effective pre-emergent control. One of these control methods involves applying certain types of herbicides during late fall or winter that will not undergo rapid degradation in cold soils. The result is that an effective "weed barrier" is firmly in place whenever weed seeds germinate during spring.

This type of preventative weed control is far superior to curative control because it is more cost-effective, less stressful for desirable turf and not as timing-dependent. For example, postemergent herbicide applications made during dry conditions are generally less effective because weeds are not actively growing. In addition, the cuticle may be thicker and less likely to absorb the control material. Before applying any material to control weeds, however, it is important to identify and understand the specific characteristics of the weeds you are targeting.

Healthy Turf Is the Best Defense

Like insect pests and fungal pathogens, weeds are most likely to infest areas where turfgrass is weakened or stressed. In fact, the ability of healthy turf to out-compete weeds is so well-established that many researchers now refer to healthy turf as one of the best "herbicides" available.

The most important ways to promote healthy turf include keeping mowing heights as high as practical and providing adequate moisture, nutrients, light and air circulation. In addition, deep, infrequent irrigation, spring aerification, and other management practices that facilitate root growth should be conscientiously employed. Maintaining healthy root systems is absolutely crucial to turfgrass health because the health and vigor of any turfgrass canopy is directly related to the quality of the root system supporting it.

Goosegrass

Goosegrass is often referred to as the single most "important" weed in the United States. This is largely due to its wide geographic distribution and the fact that it can thrive in a variety of environments, including closely mowed turf.

This grassy weed, which reproduces by seed, is classified as a "bunchgrass." It has smooth, flat stems and narrow leaves with parallel veins. Seeds produced by the short, stiff seed heads germinate when soil temperatures are between 65 and 85 degrees Fahrenheit and often out-compete other grasses in locations that are prone to drought stress and soil compaction. Areas with high amounts of foot traffic and especially vulnerable to compaction.

Crabgrass

Although perhaps not quite as difficult to control, crabgrass is an even more widespread pest than goosegrass. Crabgrass is an annual weed that reproduces by seed when temperatures rise above 55 degrees F; however, germination declines for both the "hairy" and "smooth" varieties of this pest.

Both hairy and smooth crabgrass have the common characteristic of smooth, stout stems. Their leaves have a light "apple-green" color. Crabgrass seeds are tiny, thin, oval and light-colored.

Annual Bluegrass (*Poa annua*)

Another very common weed encountered by warm-season turf management professionals is annual bluegrass. Although it is sometimes a desirable species, this grass can become a weed when it invades other types of more desirable turf. Because this seed-producing weed is a lighter colored grass than more desirable species, it can become very visible and unsightly.

Annual bluegrass is characterized by its slender, flattened stems and slightly tapering, smooth leaves with parallel veins. Like goosegrass, this pest is able to produce weed even on closely mowed turf. In some regions of the country, it germinates in the spring as well as the fall, making two herbicide applications necessary. While a winter application will control spring-germinating weeds, a second application will probably be needed for weeds germinating during late summer.

Avoid any management practices that make it easier for annual bluegrass to become established. These include the use of excessive amounts of phosphorous and high levels of irrigation.

Chemical Control Options

Even with the best management practices, weeds often still emerge in areas that have had weed problems in the past. This is largely because the earlier generations of weeds in these areas left a reservoir of viable seeds in the soil, which can lie dormant for extended amounts of time before emerging when conditions are right.

Pre-emergent herbicides should be selected based on their ability to effectively control the targeted weeds and yet not injure vital turfgrass root systems. Such products include Ronstar® brand oxadiazon herbicide. Because it is shoot-absorbed, the product does not prune roots, even on newly overseeded or severely stressed turf. In addition, it can be applied several weeks in advance of weed seed gemination with breaking down or losing efficacy. Because fall of winter applications of pre-emergent herbicides are not rapidly degraded during the winter, they will still be in place and ready to provide an effective herbicide barrier when weeds geminate in the spring.

Diligence Is Key

Because weed seeds can lie dormant for years and can be blown into "clean" areas from nearby infested turf, the potential for infestation is always present. By applying effective pre-emergent herbicides during late fall or winter, and by taking every step possible to ensure your turf is healthy and established before weeds geminate, you will be well-armed to control weed outbreaks. ❑

Editor's note: Tom Vrabel, Ph.D., technical development manager, and Laurence Mudge, field development specialist, are with Rhone-Poulenc Ag Company. Ronstar® is a registered trademark of Rhone-Poulenc.

Infield Maintenance:

Focus on Skinned Areas

To repair holes, add premoistened packing clay and use a hand-held tamping device to work the packing material firmly into place.

A nail drag should be used a minimum of once a week, more frequently if possible. Photos courtesy: Aimcor.

By Ed Miller

Sports field exist for athletes. The top priority of sports turf professionals is to provide a safe playing field. Beyond that, a field in excellent condition not only "looks sharp," but also gives athletes the best chance to perform at their highest levels.

Player safety is an integral part of all phases of field construction and maintenance. Every step that improves the overall quality of the field also strengthens its playability — and safety.

Initial field construction and annual renovation aim to create fields that will resist compaction, drain effectively, be free of soggy or slippery spots, and retain soft, playable surfaces. Whether working with native soils or specially formulated field mixes, the addition of a conditioning agent that has the ability to absorb and gradually release moisture makes these more attainable. Such fields are less likely to have rainouts or play action affected by weather-related factors. Athletes such have to concentrate on the game, not on field conditions.

Explore All Avenues

With every field, a high percentage of play is centered on specific areas. For baseball fields, the most highly stressed areas are the skinned portions of the infield. Establishing a daily maintenance routine and sticking to it will make significant improvement in the condition of a problem field and keep a superior field in top shape.

Enlist help from others who have a vital interest in the field. Discuss field maintenance needs with coaches, and perhaps work with them to assign players certain daily areas of responsibility. Draw on parents and booster clubs to participate physically or financially or both.

Emphasize the importance of keeping the field in the same shape for practices as games. Inconsistencies can lead to errors and cause the team to lose the "home field advantage." Maintenance should be performed immediately following use — the field left in good conditions for the next day's play.

A daily field inspection is the single most important step a sports turf manager can perform, both for the safety of athletes and field playability. As groundskeepers slowly walk athletic fields, they can spot potential hazards such as large stones in the skinned areas of base paths, unretracted sprinkler heads, holes or animal burrows, damaged fencing, or loose sprinkler heads. Unfortunately, it's also necessary to keep a sharp look out for hidden hazards that may be placed by vandals to cause hazards.

Following any action required to remove hazards discovered during inspection, actual maintenance of skinned areas can begin.

Techniques and Tips

Pitcher's mounds take a lot of abuse during games. After the game, sweep and remove loose material from worn areas of the mound. Loose materials should not be swept into the turf as it will only lead to future repair problems. A channel surrounding the edge of the pitcher's mound will prevent runoff on the infield mix into the surrounding turf. Check this daily and use a spade to repair breaks in the channel if necessary.

With the point of a pick, loosen the material in the worn areas in front of the rubber. Water the loosened areas light-

ly so packing material will bond more easily. Add premoistened packing clay and use a hand-held tamping device to work the packing material firmly into place. Start in the patched area, tamping outward gradually to maintain an even surface. Keeping the mound area just in front of the rubber approximately 1/2-inch below the level of the rubber will discourage "digging" by the pitcher. Next, tackle any needed repairs in the landing area.

Once the areas are firm, lightly moisten them one more time. Using a rake, gently pull dry material over the wet spots. Lightly rake the entire mound area and roll it. After rolling, moisten. If possible, cover the pitcher's mound with a tarp to keep it moist and firm, regardless of weather conditions.

The batter's box and catcher's box also take heavy abuse. It is important that these areas remain firm and level. Repair holes using the same series of steps as those used to repair worn areas in the pitcher's mound. Check the entire batter's box to ensure a firm and level surface after repairs and rolling have been completed and the area has been moistened. Then tarp the area if possible.

Watering keeps the field soft, prevents wind erosion, and keeps the clay mix from drying and breaking down. A moist infield also is more playable and easier to maintain. A calcined clay, such as Turface Regular, incorporated into the infield helps maintain the correct moisture level.

Use supplemental watering based on weather conditions. When watering of the skinned areas is needed, simulate a natural rain shower as closely as possible. Hold the nozzle at an upward angle to provide a gentle spray pattern. Plan watering according to game time. Often, morning watering can allow a partial dry down, leaving the field just damp enough for the pregame nail drag and mat drag procedures. Remember, the higher the degree of moisture that remains by game time, the slower the field.

Daily dragging keeps the skinned surface loose, level and consistent. Although there are a number of ways to drag a skinned area, there are some keys rules to follow. Dragging should be done slowly. Going too fast can cause an uneven surface and the loss of some material. Slowly drag the perimeter of the skinned area before starting the dragging pattern. Leave at least a 6-inch buffer between the drag and the edge of the turf to prevent buildup of "lip" material along the turf edge. Use a rake to scarify the 6-inch area missed by the drag.

When dragging, alternate the daily starting and stopping points to prevent developing high spots that could trap water on the field. Use a rake to spread and even out the small pile of material that accumulates at the daily stopping point.

A nail drag should be used a minimum of once a week, more frequently if possible. The field should be damp, so lightly moisten the skinned area with a hose if necessary. The nail drag extends 1/4- to 1/2-inch into the surface, relieving surface compaction and ensuring a loose, friable surface that is easier to maintain. The weight of the drag alone should be adequate for normal use; however, additional top weight can be added for use in badly compacted areas. The nail drag can also be used to incorporate small amounts of calcined clay to counteract excess moisture or compaction.

Use a mat drag to provide a smooth playing surface following the nail drag,

continued on page 16

Infield Maintenance

continued from page 15

as well as on a daily basis. A rigid mat drag with a leveling bar on the front is most effective — it fills in low spots and ensures a level field. Flexible drags have a tendency to dip into low areas, making field leveling more difficult.

A landscape rake can be used to scarify the base paths, achieving the same benefit as dragging. Rake lengthwise, rather than side-to-side, to avoid pushing loose materials into the turf.

Keep the base paths firms to ensure good footing for players. To prevent slippery conditions, calcined clay over each base path and work it in with a landscape rake. This also helps cut down on dust and "blow off."

Following raking or mat dragging, prevent lip buildup by using a stream of water from a hose, a leaf blower, rake or stiff-bristled broom to move all loose material at the edges of the turf back onto the skinned surface. Rake and remove any grass that is brushed onto the skinned area.

Edge the infield turf to preserve accurate base lines and give the field a finished look. Use pegs and string to ensure straight lines. Run the string from a peg placed just behind home plat to peg placed to the outfield side of first base. Measure 36 inches from the string toward the infield grass. Place pegs at each end of the infield grass and move the string over to these pegs. The string line now represents the accurate placement of the infield grass line. Use a spade, sod cutter or power edger to cut along the string line. Repeat the same procedure for the remaining base lines.

If a lip as occurred, use a sod cutter to remove all turf cover the raised area. Set aside and protect the sod. Then, slice away all buildup materials with a sharp shovel until the surface area is on an even plane with the with the surrounding infield and outfield surfaces. Level and scarify the surface and return the sod to its original position. Topdress any damaged areas or exposed soil, leveling the topdressing material with a rake. Water the sod lightly as needed each day to prevent it from drying out before re-rooting is complete. Once the roots have knit, water more deeply, but less frequently, until the sod is well-established.

Even the best maintenance programs will be thrown an occasional curve by Mother Nature. When excessive rainfall saturates the soil, pour Turface Quick Dry into puddles, or spread it over spots of standing water. Once the water is absorbed, rake the material lightly into the soil. For damp spots without standing water, apply a thin coating of the quick drying agent to the area and lightly work it in with a rake or push broom. The material will remain a part of the infield, providing long-term control for trouble spots.

Finally, keep good records of all field maintenance. These provide a building block for future improvements and proof that steps have been taken to ensure play safety.

The daily half-hour of routine infield skinned area maintenance might just your field into some young athlete's path to the majors. ❑

Editor's note: Ed Miller is former chief groundskeeper for the New York Yankees training facilities. He is currently a consultant for Turface Sports Field Conditioners, Deerfield, IL.

EXPLORING EQUIPMENT

Calibrating Pendulum Spreaders

By Pete Thompson

There are several considerations you need to take into account before calibrating a pendulum spreader. You are paying for an agronomic benefit when applying fertilizers and/or control products, and we all like a good return on our investments. Therefore, when we put down a dollar's worth of product, we like to see a dollar's worth of benefit.

The proper product and application rate will help us with aesthetics and, at the same time, is beneficial to the turf. Properly choosing and applying these products is critical. Improper product applications will reduce the effectiveness of the product being used. Erratic results, wasted product, damaged turf and even repeat applications — all can be the result of improper spreader calibration. By accurately calibrating your spreader, you can eliminate the above and achieve fantastic results.

Other considerations prior to calibrating your spreader are the unit itself and the equipment used to operate it. Make sure all your equipment is set to provide the proper ground speed and proper PTO rpm. To maximize spreader results, make sure that the inside of the hopper and the inside of the spout are clean. Also, check that all lubrication points are greased and that the spreader is in top mechanical condition.

Calibration of a pendulum spreader is more simple than you may think. Using the slide rule supplied with the unit, note that there are five individual steps needed to calibrate. Prior to starting spreader calibration, you will need:

- A watch with a second hand.
- A 5-gallon bucket or its equivalent.
- A scale.
- A tape measure.
- The product to be calibrated.
- The slide rule supplied with you spreader.

For initial spreader setting, set the spreader on number 28 of the regulating handle. Put approximately 50 pounds of product into the hopper. With your spreader running at its proper speed, open the hopper and let the product fall from the spout for about 10 seconds. Measure the swath width of the product. Using the slide rule, set the cross hair to the swath width measured in your test. Let's use an example of 40 feet.

Determine the amount of product in pounds per acre for step number two. Using a product such as 24-5-11, to get one pound of nitrogen per 1,000 square feet, it takes 3.625 bags per acre. This amounts to 181 pounds of product per acre. Slide the white card inside the ruler until the cross hair aligns with the 181-pound mark.

Step three is to figure out how many miles per hour you will be traveling across the turf. Using an example of 5 mph, move the cross hair to the 5 mph mark on the slide rule.

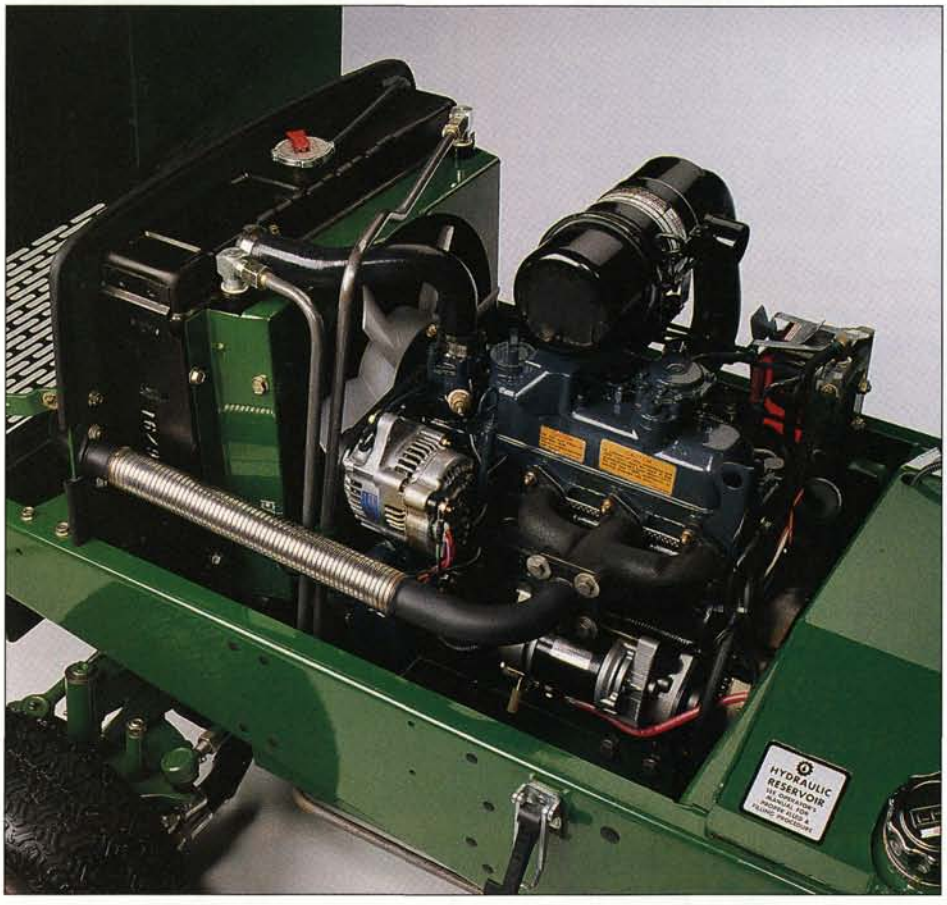
Step four shows pounds per minute the spreader needs to spread at five miles per hour for 181 pounds per acre at a 40-foot swath width. In our example, we will need to collect 74 pounds of product per minute.

Step five is to remove the spout from your pendulum spreader, place a bucket underneath the spreader discharge port, with the spreader running at its proper speed, and collect the product for 15 seconds. Close the hopper. Weigh the mount of product collected during those 15 seconds, and multiply your results by four. Assume that, with the spreader setting at number 28, you have only collected 64 pounds of product per minute. This would mean you are 10 pounds short of your 74-pound-per minute collection target. To reach this goal, you will need to collect 19.5 pounds in 15 seconds, or a total of 74 pounds per minute. Adjust the regulating handle to setting number 33, and recheck the amount of material coming out of the spreader. When you have achieved 74 pounds per minute — again, just an example — you have set your spreader properly and are ready to apply the product.

Editor's note: Pete Thompson is manager, application equipment, for Lesco Inc.

Mower Maintenance:

An Ounce of Prevention



Routine maintenance of mower engines and blades will enhance mower longevity. Photos courtesy: Ransomes America Corporation.

By Matthew Trulio

Even the most reliable machines are, by nature, destined to eventually fail. They're mechanical devices, full of moving parts under stress, powered by explosive fossil fuels or unpredictable electricity. A pickup truck that goes 200,000 miles without a hitch may call it quits at 200,001. A good old, reliable water heater may be anything but on a bitter winter morning. A never-fail refrigerator can unexpectedly become a hot box, particularly after it's just been filled with groceries. An "always starts" athletic field mower may die the day before a big game.

Still, there are some machines that seem to last longer than others and mowers are no exception. The question is why.

Starting out with a high-quality product, which often comes at a higher price than less reliable models, is a part of the answer, but not all of it. Even a top-end machine can break down. All things being equal in terms of product quality, the real common denominator in the longevity of any machine isn't design or construction. It isn't the power plant, and it isn't the electrical system. It's the *owner or operator* and what he's willing

to do to keep that machine running. It's not magic that keeps a machine going year after year — it's consistent ongoing maintenance.

The Little Things

Ongoing mower maintenance can be broken into daily, weekly, monthly and yearly categories. While "major service" intervals may come monthly or even yearly and will probably be handled by your dealer, it is the little daily things that make a tremendous difference in mower performance and longevity. Here are a few of the most crucial:

• *Visual Inspection.* Begin the day's operations with a visual inspection of the mowers — and all machines — you intend to use. Visual inspections can pick up oil and fuel leaks, worn or broken belts, and other elements that often inhibit performance.

• *Oil.* Oil is the lifeblood of all internal combustion engines. Check it daily. However, ensuring the proper oil level at all times is only half the job. The oil has to be clean. Dirty, worn oil lubricates inadequately, which causes excessive engine part wear and substandard performance and reduces engine longevity. Oil should be changed religiously at intervals specified in your owner's manual; however, if it isn't "time" for an oil change but you find the oil is dirty, change it immediately, before operating the machine. Dirty oil may be the sign of dirty oil filter. Make checking the oil filter, and changing it as needed, part of your daily routine.

The bottom line is that dirty oil and oil filters cause engines to work harder, which reduces longevity. Mower engines work hard enough already.

• *Fuel.* In the case of gasoline-powered mowers, high-octane fuel is often recommended. Don't cut corners for a few pennies — lower octane fuels will decrease power and performance. That reduces productivity, which means the machine will have to work longer to do a job it could do in less time if it were operating efficiently. Reduced efficiency translates to reduced longevity. Also, if you store fuel on site or have fuel trucked in, check it regularly for contamination. Water in fuel can kill an engine. Inexpensive fuel contamination test kits are available.

• *Water and Coolant.* Water cools engines efficiently, provided there is enough of it to do the job. It's easy to forget checking radiator water and coolant levels, but on a hot day nothing will stop a machine faster than overheating. The stress of overheating on an engine can significantly reduce its life — it simply should be allowed to happen. If your mower employs a cooling system, check fluids daily.

• *Air Filter.* Mowers operate under stress in a hostile environment. They kick up dust and grass as they cut. Whether your machine employs fuel injection or carburetion, clean air is essential for proper operation of all internal combustion engines. That's the job of the air filter, but a filthy filter can't do the job. A clogged air filter will hamper engine performance and, perhaps worse, permit some foreign object to enter the engine. Daily cleaning and checking of the air filter is a wise move. Again, an engine that is forced to work harder than it has to will have a much shorter life.

• *Cleaning.* "A clean machine is a fast machine" — so goes the hot rod enthusiast's aesthetic axiom. And yet, there's more than a grain of truth to it, particularly in the case of mowers. Excessive external dirt and grime on a mower engine increases the likelihood that

continued on page 20

Mower Maintenance

continued from page 19

some of the dirt and grime will find its way into the engine. Regular engine cleaning, through a manufacturer-recommended method, is good preventative maintenance. In addition, your mechanic will thank you when it comes time for major service.

Keeping the exterior of your mower clean, particularly the underside of cutting decks, is also crucial. Freshly cut grass is loaded with moisture. Clumps of it left on metal surfaces could lead to rust and corrosion. There's also an element of professionalism to consider, particularly if you're in the public eye. While you can't be expected to keep your mower looking sharp throughout the day's cutting, starting with a clean machine enhances the perception of professionalism.

• *Blades.* Reel or rotary, mower blades need to be kept sharp for two equally important reasons. First, dull blades force a mower's engine to work harder to cut the grass — much harder than it has to. That means increased engine wear. Second, dull blades do not cut grass cleanly, and rough cuts are not healthy for turf.

Manufacturers' service manuals offer rotary and reel mower sharpening intervals, based on estimated use and wear averages. Those recommendations are well-considered; however, they are also *general*. A manufacturer can't possibly know all the variables in your specific situation. Therefore, while it's important to heed manufacturers' guidelines, it's equally important not to ignore obvious blade wear, simply because it isn't "time to sharpen." That doesn't mean oversharpen, which can reduce blade life, but there are things in your cutting day the manufacturer can't take into account — like mowing over hidden obstacles that dull blades. Take a minute or two to check blades daily, and in the case of rotary mowers, keep an extra set handy.

Build Routine

A conscientious operator is unlikely to miss getting his mower to the dealer or in-house mechanic for a major service interval. Those intervals are clearly spelled out in all owner's manuals, and for some reason, call it being human, most of us seem to remember "big things." Yet it's easy to forget, put off, or otherwise ignore the ongoing maintenance basics. We're in a rush at the beginning of the day, and burned out at the end of it. We just checked the oil, filters and blades yesterday morning, and everything was fine — we just cleaned the mower last week. Nothing could have changed that much.

Too often, that assumption is followed by a "What happened?" when the machine breaks down the next day.

The key to religious ongoing maintenance is establishing a routine for you and your crew. What appears to be "a hassle" the first few times eventually becomes automatic. Crewmembers should be required to perform basic checks before any piece of equipment leaves the storage area. If a crewmember spots a problem during the morning's equipment inspection, make sure to compliment him on stopping a potential breakdown before it starts. You'll reinforce the diligence required to make daily maintenance a routine. And in the long run, the headaches you save may well be your own. ❑