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# **INCREASING PROFITABILITY** AND CUSTOMER SATISFACTION WITH LAWN CARE SERVICES

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October 2014

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## **EXECUTIVE SUMMARY**

- According to the 2014 LM150 report from Landscape Management magazine, seven of the country's top-25 landscape maintenance companies are also in the top-25 lawn care companies. As competition in the maintenance category increases, an increasing number of landscape maintenance professionals are adding lawn care services as a way to deliver increased customer satisfaction while also increasing profitability.
- Thanks to recent advances in stand-on lawn care equipment such as aerators and spreader sprayer machines, landscape professionals can deliver high quality lawn care services more profitably than ever. New machines such as the Exmark<sup>®</sup> spreader sprayer offer greater flexibility in the chemicals used for weed and pest control, allowing lawn care professionals to do more with each pass of the machine.
- Exmark estimates the switch from a 21-inch walk-behind aerator to a 30-inch stand-on machine can be paid back in 2-3 weeks. Lawn care professional Kent Harlan said he has made enough money to pay for his \$9,500 Exmark spreader sprayer in 2-3 days.

- In a competitive marketplace, the addition of lawn care services is a competitive advantage for an existing maintenance business. Today more than ever, customers want to hire a lawn care expert that can deliver a beautiful, manicured, weed-free yard. They don't want to deal with one contractor for maintenance and another contractor for aeration, fertilization or weed control. As such, the opportunity exists to make more money for contractors willing to add the lawn care services customers want and need.
- Today, it's easier than ever to add lawn care services to an existing maintenance business. When deciding which services to add, listen to customer feedback to learn which services have the most demand.
- Employee training is important for the quality delivery of lawn care services. Additionally, certification and licensing are required for landscape professionals looking to add fertilization or chemical application services. In most states, certification and licensing are coordinated by the Department of Agriculture, or Office of State Chemist.

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### Cover and Executive Summary Photo: Exmark Mfg.





### **1. OBJECTIVE**

The objective of this white paper is to help landscape maintenance professionals understand the opportunities that exist to increase customer satisfaction, retention and profitability through the addition of lawn care services such as aeration, fertilization and weed control. It will demonstrate how new equipment technology is making it easier to deliver top-notch results, and do it safer and more quickly than ever before.

### 2. BACKGROUND

Never before has the landscape maintenance market been more competitive than it is today. As competition has grown in the maintenance market, an increasing number of landscape professionals are looking for ways to increase profitability and keep experienced workers busy. Many companies have found that adding lawn care services such as aeration or fertilizer and chemical application, is an effective way to not just hold the status quo, but rather grow their businesses.

According to the 2014 LM150 report from Landscape Management magazine, seven of the country's top-25 maintenance companies are also in the top-25 in lawn care services. This highlights the fact that, while lawn care may be a great compliment to a maintenance operation (and vice versa) it's not necessarily a requirement for success. (1)

Joe Kucik, founder and president of Real Green Systems, said lawn care services are a great compliment to an existing maintenance business.

"As far as profitability goes, lawn fertilizing is more profitable than lawn maintenance. There are a lot of reasons for this, but the certification and licensing requirements in particular create a higher barrier for entry."

Kucik, whose company also offers business management and marketing software to landscape firms, is in a good position to understand the profitability of a variety of landscape services. He said that, from a bottom line standpoint, services such as aeration or chemical and fertilizer application are proven money makers.

"Most people will tell you fertilizing is a much more profitable part of the business. You earn more revenue per day with fewer people. One person can normally do \$1,200 to \$1,400 in revenue per day in lawn care. In maintenance, it's going to be a lower number than that, so adding lawn care to a lawn maintenance business makes a lot of sense."

In Kucik's experience, aeration is even more profitable than chemical or fertilizer application. And since many customers appreciate being able to work with one company for as many landscape services as possible, adding services complimentary to maintenance is a natural business evolution. (2)

Statistics from Lawn & Landscape magazine's 2013 State of the Industry report show that 19-percent of landscape professionals predict lawn care services will be their fastest growing service in 2014, placing it in the top-three services, behind maintenance (at 34-percent) and design/build (at 22-percent). (12)

### **3. LAWN CARE EQUIPMENT TODAY**

Recent innovations in lawn care equipment make it easier to integrate lawn care services into an existing maintenance business. In particular, recently-introduced stand-on machines perform tasks such as aeration, or chemical and fertilizer application, with a level of productivity, safety and effectiveness not possible just a few seasons ago using existing walk-behind or handheld equipment.



Stand-on aerators dramatically reduce the amount of work that's required to aerate a property. Users report reduced employee attrition and increased profitability as a result. Photo: Exmark Mfg

Exmark Product Manager, Lloyd Von Scheliha fertilizer and chemicals to lawns. Machines like said the move to stand-on machines in lawn the Exmark Stand-On Spreader Sprayer give care has been perpetuated by a need to make lawn care professionals the ability to apply a hard jobs easier for landscape professionals. wider variety of materials and do it faster and more safely than with traditional hand-held or "Historically, lawn care services such as walk-behind equipment.

aeration were some of the toughest, most physically demanding jobs. Traditional Kent Harlan, owner of Kent's Lawn Service in walk-behind aerators required strong, fit Beatrice, Nebraska, said no single machine has employees to operate every day. In fact, positively impacted his business more than the contractors often talk about the challenge of Exmark Stand-on Spreader Sprayer he's been offering walk-behind based aeration services using during the 2014 season. The machine, a with respect to its effect on employee final prototype of the spreader sprayer Exmark retention." (4) will offer to the public in 2015, gives landscape professionals a number of distinct advantages Recent advances in ride-on aerators give compared to the stand-on machines that came landscape professionals a new option that is as easy to operate as a stand-on mower. before it.

Because the operator rides on the unit and can aerate at up to 7mph, operator fatigue is dramatically reduced while productivity increases significantly.

Combine this increased productivity and ease of use with the superior consistency stand-on machines can deliver and it's easy to see why an increasing number of landscape pros are using them to increase customer satisfaction and ultimately, make more money.

### 3.1 STAND-ON SPREADER SPRAYER

In recent years, stand-on spreader sprayer machines have revolutionized the application of



The machine's exclusive lean to steer technology and an innovative control layout give Harlan the ability to simultaneously control machine direction and speed, in forward or reverse, with one hand. This frees the other hand to run spread or spray controls, or perform spot treatments with the easily accessible spray wand.

"With the lean-to-steer controls on the Exmark machine, I end up spraying as much with the wand in reverse as I do going forward," Harlan said. "I have enough control with one hand that I can simultaneously spray using the wand in the other hand, even going backward. The simple controls make it easy to do."

> The exclusive leanto-steer control layout allows Exmark spreader sprayer users to control the speed and direction of the machine with one hand, leaving the other hand free to operate the fingertip spreader and sprayer controls. Photo: Matt Gersib

The control layout of the Exmark spreader sprayer gives Harlan fingertip control over all spraying and spreading functions, with one-hand maneuverability.

"You don't realize until you try it (the control system): it's truly better. In all honesty, at first sight I didn't think it'd work, but now that I've used it, I think it's one of the most impressive aspects of the machine."

According to Harlan, aside from the Exmark machine, each of the varying control layouts of machines from other manufacturers he's tried have their issues, each of which require more coordinated effort for the operator.

"One machine I own has a steering wheel - you can't run it with one hand. Another machine works pretty well on flat ground, but because it's an articulating unit (which pivots at mid-frame), it is very easy to roll on a side hill.

"Very few lawns are completely flat, so having a machine that's stable on an incline is extremely important from a safety standpoint."

The spray system is another Exmark innovation that allows Harlan to provide more consistent weed control.

"Having two wide-spray nozzles up front is a major advantage in terms of consistency of coverage," Harlan said.

"When we're talking about a 10- to 11-foot coverage

area, the Exmark machine consistently covers the entire area. With a single-jet machine, you're throwing droplets that are two-to-three times larger than on a machine with two jets. This doesn't give you the precision application control you can achieve with a dual-iet machine." (3)

Von Scheliha said the decision to use two wide spray jets on the Exmark machine was a direct response to feedback the company received from customers (including Harlan) during the machine's two year design and prototype process. He also noted the machine's single centrally mounted spray nozzle for narrow spray applications, giving operators a wider variety of application options.

"We tested a variety of configurations before we finalized the machine's nozzle placement. When combined with the fingertip controls, the spray system allows chemical application with an unmatched level of precision and consistency in both wide- and narrow-spray applications." [4]

According to Harlan, perhaps the most significant advantage of the Exmark Spreader Sprayer is the agitation system contained within the machine's lowprofile 20-gallon tank. The system's two induction nozzles keep material in suspension better, allowing him to more consistently apply a mixture of chemicals based on the needs of his customers and their lawns.

Many of the chemicals come in the form of wettable



Left: The ability to simultaneously drive and perform spot spraying is a distinct advantage, according to Kent Harlan. Middle: Twin wide-spray jets give the Exmark machine the ability to consistently spray at widths of more than 10-feet. A centrally-mounted narrow-spray nozzle is optimized for situations where a more narrow spray pattern is preferable. Right: The agitation capability of the Exmark spreader sprayer allows Kent Harlan to mix a wider variety of chemicals and do more with each pass of the machine. Photos: Matt Gersib

powders, which he says aren't usable in other machines.

"I'll dump all the materials into the tank, open the agitation circuit and wait about 40 seconds for it to mix. At that point, I'm ready to spray. And if I put the machine away for the night with half a tank of material, as soon as I start that agitation circuit it quickly puts the material back into suspension.

"Nobody else's machine puts material into suspension and keeps it in suspension as well as the Exmark. In my opinion, that is the key difference between what Exmark is coming to market with and the others.

"The agitation capability of the Exmark machine allows us to mix a greater variety of chemicals, so we can do more with each pass. It gives us the opportunity to add profitability in unexpected places we didn't think of on the front end." (3)

### 3.2 STAND-ON AERATOR

For lawn care professionals, the stand-on aerator has transformed the job of aeration. simultaneously making it easier and more profitable to perform. The increased maneuverability and reduced physical demands of the stand-on design make it possible to more quickly aerate an increased number of properties each day.



- According to Kucik, since aeration is one of his most profitable services, stand-on aerators have helped grow his business through increased productivity. The machines have also had a positive impact on employee retention.
- "Aerating used to be the most difficult job in the company. It's very physical with a walk-behind aerator. You had to muscle it around, so we went through aerating employees continually."
- The employee attrition combined with the lower earning potential of walk-behind based aeration made it a challenging service for the businessman in Kucik to justify.
- "With walk-behind aerators, revenue per day was lower because you simply couldn't get as much work done. It was very difficult from a fiscal aspect."
  - The Exmark 30-inch Stand-On Aerators Kucik's crews began using in 2013 have transformed one of his toughest jobs into a job virtually any of his crew members can perform all day, sustainably, day after day.

"With the ride-on aerators from Exmark, you don't have to be an athlete to run the machine. And you can get more productivity out of each operator, which means more money coming in each day.

"You can double the number of aerations you can do in a day easily with the stand-on aerator," Kucik remarked. (2)

Exmark's von Scheliha agreed with Kucik's assessment, adding the stand-on aerator is no harder for most people to operate than a stand-on mower.

> "With the ability to aerate at up to 7 mph and turn while the tines are engaged, the Exmark 30-inch Stand-On Aerator is easier to operate and more productive every day than any walk-behind machine." (4)

The machine offers the ability to achieve an exceptional range of core depths of 2- to 5-inches, making it appropriate for virtually any aeration application. Instead of relying on the strength of the operator to raise and lower tines, the Exmark stand-on machine does it with a hydraulic system. The design of the machine centralizes both machine and operator mass directly over the tines. This provides consistent coring performance in a wide variety of turf types and conditions.

### **4. ECONOMIC ANALYSIS OF** LAWN CARE

Do the math and it's easy to see the appeal of lawn care services delivered with stand-on machines. Exmark estimates the switch from a 21-inch walk-behind aerator to a 30-inch standon unit can be paid back in 2-3 weeks. The company says the 30-inch stand-on aerator increases productivity on-site by 168-percent. This productivity advantage allows contractors to do more, and make more money every day.

Kucik said aeration is one of his most profitable services.

"A typical lawn will be in the ballpark of \$100 to aerate. For fertilizing, you're typically in the neighborhood of \$50, and for mowing you're probably looking at \$35." (2)

Considering a typical lawn can be aerated in

8-12 minutes using a stand-on machine, it's easy to see the profit potential the machine presents.

Based on an average 10,000 sg. ft. property, at a rate of \$8.50 per 1,000 sq. ft., Exmark says its 30-inch stand-on aerator is easily capable of earning \$4,000 or more each day at 80-percent productivity. (5)

Harlan said the specialty applications can bill up to \$12 per 1.000 sq. ft. Material costs can vary significantly, depending on the quantity of materials a landscaper purchases annually, but are typically a fraction of the billing rate.

"It's real money in my pocket at the end of the day. The fact is, this machine costs less than \$10,000 and can produce revenue of up to \$12 per 1.000 square feet. That's incredible profitability. With this machine's exceptional productivity, we can literally pay for in less than a week." (3)

	EXMARK AERATOR	YOUR CURRENT AERATOR
Speed (mph)	7	4
Operating Width (inches)	30	26
Multiply by the Constant (convert to sq ft)	440	440
Square Ft/Hr Productivity at 100%	92,400	45,760
Efficiency Rate multiply by .70	0.7	0.7
Square Ft/Hr Productivity at 70%	64,680	32,032
Average Property Size (sq ft)	15,000	15,000
Average Property Size divided by Productivity Rate	0.23	0.47
Mulitply by Constant 60 (minutes/hr)	60	60
Average Minutes per Property	13.9	28.1
Add Average Travel Time between Jobs	20	20
Total Average time per property	33.9	48.1
Average Job per hour	1.8	1.2
Average Hours per Day	8.0	8.0
Average Jobs per Day	14.2	10.0
Average Rate per 1000 sq ft	\$15.00	\$15.00
Rate Charged for Average Property	\$225.00	\$225.00
Revenue	\$3,184.46	\$2,245.47
Additional Revenue Potential	\$939.00	
Cost of Aerator	\$9,599.00	
Payback (days)	10.2	

Even using Exmark's relatively conservative estimates, the investment in an Exmark stand-on aerator can be paid back in about 10 days of operation. (5)

### 5. LAWN CARE AS A COMPETITIVE ADVANTAGE

The decision to add lawn care services to a maintenance business is a great move in a competitive market. When customers look to you as 'the expert' and call you for most, if not all of the aspects of their landscape maintenance, they don't just look at you as the person that makes their tall grass short. You're the person making their property beautiful. That's a big difference in perception and it can be your competitive advantage if you choose.

Kucik said combining maintenance and lawn care services gives a landscape company a powerful advantage over its competition for a number of reasons, but convenience is number one on customers' minds.

"A lot of people like having one company take care of both maintenance and lawn care. It's one check or payment per month and the lawn is just handled for them. It couldn't get any simpler."

This assessment is backed by a recent TURF Magazine story by U.S. Lawns Vice President, Mike Fitzpatrick, who said customers hire a landscape contractor because they don't want to have to manage their grounds maintenance.

"The customer most likely hired you because they don't want to worry about the landscape. They don't want to manage the grounds maintenance. They expect you to do it.

"Don't wait for the customer to call you."(6)

Kucik estimates that roughly a guarter of landscape maintenance companies in his area are also performing lawn care.

"Maybe 25% of companies in our area, in my estimate, are doing both lawn maintenance and care. Some of them are doing an 'abbreviated program' to avoid state regulation.

"In lawn maintenance, there is a wide range of contractors. Companies come and go, and you have good ones, great ones and bad ones."

He said the profitability of the services his company offers enables him to hire and retain the quality of employees he wants on his team.

"Obviously the more revenue you're generating, the easier it is to pay employees well. And that makes it easier to attract good employees.

"That's a competitive advantage." (2)

Harlan echoes that sentiment, but says he doesn't worry what the competition does. He says his company focuses on quality and the rest takes care of itself.

"There are 40 people cutting grass here in Beatrice. Including ChemLawn, there are a total of 5 companies doing chemical work."

And while there are fewer lawn care companies in his local market. Harlan doesn't attribute his company's success to a lack of competition.



The growth of lawn care services has significantly increased both revenue and profitability for Kent's Lawn Service. Owner, Kent Harlan says customers are more satisfied too – a win-win situation if ever there was one. Photo: Matt Gersih

- Rather, he says success has come through being a family operation with a focus on client satisfaction.
- "When you talk about competitors, we chose to quit competitively bidding four years ago. When we did that, our business exploded. It proved that people are willing to pay for quality, and we strive to deliver the results our customers expect. We simply chose not to compete in competitive bids.
  - "There's a difference between trying to be the biggest and working to be the best. Our customers know the difference."

### 6. GETTING STARTED

Landscape maintenance professionals looking to add lawn care services can get started reasonably quickly in most states. Depending on the service being added, it can be as simple as getting a machine and training the operator, and you're in business.

Aeration is a great example of this, as operation of a stand-on aerator is very similar to that of a stand-on mower.

For those wishing to apply fertilizer and chemicals, certification and licensing are required in each state. And while requirements for certification and licensing vary from state-to-state, a landscape professional can easily locate the requirements for their state online. Typically, a state department of agriculture, or department of environmental protection, is a good resource for information on certification and licensing requirements.

Kucik said that with a ride-on unit that spreads and sprays, all somebody needs is a machine and certification for the operator, and they can be in the lawn fertilizing business as well.

### 6.1 CHOOSE SERVICES

When deciding on the lawn care services to add, consider the questions you're getting from your current customers. What are they asking for? What turf issues are they having that you aren't helping to solve? It's important to understand where the opportunities are, so ask questions and listen to your customers' answers to gain insight on which lawn care services will add the most value.

A customer survey is a great tool in these situations, as it can make the process of fleshing out the value of specific services within your existing clientele. Today, it's easier than ever to conduct surveys using online resources such as SurveyMonkey. com, GetFeedback.com and others.

The data you receive from such a survey can help you better understand where the low hanging fruit resides. For landscape companies serving multiple cities or states, customer surveys can help identify specific local or regional needs, so more informed decisions can be made with respect to product offering by branch.

Often, landscape maintenance companies will add the lawn care services that most directly affect the quality of the turf. Aeration, fertilizer & chemical application, seeding and dethatching are popular additions.

### 6.2 CONSIDER SEASONALITY

Most lawn care services are seasonal, so machines need to be able to reliably produce during the season in which they're being used. An aerator may be used all day every day for 12 weeks in the spring and another six weeks in the fall, but otherwise may sit idle for the remaining eight months. But while the length of the useful season for most lawn care equipment may be limited, the earning potential while the machines are 'in season' is substantial. As a result, it's important to understand the specific seasonality of the services with respect to your location and prepare to meet the needs of your customers while the demand is there.

In the example of aeration, determining the 'right' season for aeration depends on what type of grasses you're caring for. Areas with cool season grasses see the most aeration activity in the fall and late-spring, while areas with warm season grasses predominantly see aeration in the spring and early-summer.

One exception to the seasonal model is fertilizing and chemical application, which spans the duration of the growing season in most locations.

### **6.3 TRAIN EMPLOYEES**

When considering the addition of lawn care services, it's important to give thought to how you'll train employees. Very few things can negatively affect customer satisfaction and profitability than unprofessionally-delivered services. A good training program helps to ensure consistent quality in service delivery, so satisfied customers stay satisfied longer and dissatisfied customers are quickly taken care of.

Depending on the services being added, consider the resources at your disposal. For



A lawn care professional can make money with a stand-on spreader sprayer during most, if not all of the year in many locations. most lawn care equipment, the local equipment dealer can be an excellent resource for training specific to the equipment being used.

Other resources for training include state departments of agriculture, or local Universities or colleges offering turfgrass science or landscape management courses.

Often, when a lawn care maintenance operation begins offering one or more lawn care services, it will focus its more experienced employees on the jobs.



Training and certification are necessary for any employee that will apply chemicals. Requirements for certification and licensing vary by state. State Departments of Agriculture or Extension agencies are typically good resources for specific requirements in your state(s) of operation. Photo: Matt Gersib

As Harlan's lawn care work has grown, his daughter and wife have taken over much of his mowing business. This allowed him to focus his energies exclusively on material application.

"To-date this spreader has 29.5 tons of material run through it," Harlan said "It was all applied by me. For the last 2 months, I've been devoted solely to application. Being a family-owned business, my wife and daughter have taken on almost all of the mowing so I can focus on application." (3)

The websites of Universities and colleges with turf grass science programs can be a great resource for information and training on a number of lawn care issues, including weed control, pest control, soil testing, maintenance calendars for popular turforasses and more.

# LEADING TURFGRASS EDUCATION PAGES INCLUDE:

AggieTurf – Texas A&M University Turfgrass Program http://aggieturf.tamu.edu

University of California Statewide Integrated Pest Management Program http://ipm.ucdavis.edu/index.html

Clemson University Turfgrass Program http://clemson.edu/extension/horticulture/turf

Cornell University Turfgrass Program http://hort.cornell.edu/turf

University of Florida Turfarass Science http://turf.ufl.edu

Michigan State University Turfgrass Science http://turf.msu.edu

University of Minnesota Extension - Lawn & Turfgrass Management http://extension.umn.edu/garden/turfgrass

NC State University Center for Turforass Environmental Research and Education http://www.turffiles.ncsu.edu

University of Nebraska-Lincoln Turfgrass Extension http://turf.unl.edu

Penn State University Center for Turfgrass Science http://plantscience.psu.edu/research/centers/turf

Purdue University Turfgrass Science http://agry.purdue.edu/turf

University of Tennessee Extension - Tennessee Turfgrass http://tennesseeturf.utk.edu

### 6.4 CERTIFICATION AND LICENSING

Certification and licensing is required for any landscape professional who applies pesticides or fertilizers to properties for money. Often, there are two steps to becoming licensed - certification and licensing. An applicator is required to meet specific requirements, and demonstrate competency in applying fertilizers and pesticides, typically through a combination of hands-on experience (or training) and successful passage of a variety of exams. (7, 8.91

Kucik said requirements for certification and licensing vary by state, and in some states Employee training is an important component of the delivery of quality lawn care services. In particular, landscape professionals looking to add fertilization or chemical application services must complete certification and licensing, as outlined by each state. Information for specific certification procedures and licensing requirements can typically be found with the state Department of Agriculture or Office of State Chemist.

a substantial internship under a licensed applicator is required for certification. "One of the problems you have is regulation." Almost every state has some kind of a licensing for lawn care. And in some cases, the regulations are that they have had to work for an already-licensed lawn care provider for three years, and they have to take core testing and a general test. Since they have to get licensed, in most states their company needs an insurance policy.

"So there's a barrier for entry. That's why lawn care is more profitable and less of a commodity." (2)

### 7. SUMMARY AND CONCLUSIONS

As competition grows in landscape maintenance, an increasing number of landscape professionals are looking to lawn care services as a way to differentiate their business and increase profitability. Lawn care services including chemical and fertilizer application, aeration, seeding and dethatching are not just complimentary to an existing maintenance business from a marketing standpoint; they're more profitable as well.

The recent introduction of stand-on aerators and spreader sprayer machines increases the productivity and profit potential of the services. Not only are the new machines more productive, they're easier to use, making employee retention issues related to the operation of older, walk-behind equipment a think of the past. Landscape professionals can more than double productivity while

delivering consistently high-quality services.

The addition of lawn care services gives landscape professionals a distinct marketing advantage, as many customers are looking to hire one professional to handle as many lawn care tasks as possible, and simply deliver a beautiful, manicured, weed-free landscape. It's important to get the feedback of existing customers when deciding which lawn care services to add to an existing maintenance business. Customer feedback can be collected formally, with a customer survey, or informally, through listening to the feedback of clients on-site and during other informal contacts.

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#### GLOSSARY

#### ABSORPTION

The entrance or taking-in of a chemical or nutrient into the plant. (10)

### **ACTIVE INGREDIENT**

The chemical in a pesticide that controls a targeted pest. (10)

#### **AERATION (CORE AERATION)**

Lawn aeration involves making holes in the lawn either by pushing a rod into it or by "coring", extracting a plug of soil. Aerating a lawn provides the following benefits to the lawn and its root system: Oxygen gets to the roots and the soil allowing it to "breathe". Organic fertilizers and nutrients get access to the root system. The soil can better absorb water and allow it to reach the root system. It helps to break up thatch. It loosens up compacted soil allowing the root system to grow. (10)

#### BIODEGRADABLE

Capable of being broken down into simpler compounds by microorganisms. Organic materials such as compost (made from plant wastes), certain animal manures (chiefly composted cow, chicken, or horse manures) and other naturally occurring substances. Grass clippings are also biodegradable and add nutrients to the soil. (10)

#### BROADCAST

Application of a pesticide, fertilizer, seeds, etc., over an entire area. (10)

#### BROADLEAF HERBICIDE

A weed killer designed to specifically control broadleaf weeds without damaging desirable turf. (10)

#### CARRIER

An inert material added to an active ingredient to prepare a formulation of a pesticide or fertilizer. (10)

#### **COMPLETE FERTILIZER**

Any fertilizer product containing at least nitrogen, phosphorus, and potassium. (10)

#### COMPACTION

Soils that are subject to heavy traffic are prone to compaction (compression). Compacted soils reduce drainage, increase runoff, and inhibit root growth. Aeration can help alleviate compaction. (10)

#### CONTACT HERBICIDE

A weed killer that only injures the portion of the plant or plant soil that it contacts. (10)

#### CORE AERATION

Removal of soil cores from a turf with hollow tines or spoons which, as with other methods of aeration, loosens the soil to help alleviate soil compaction, reduce thatch and help water and air circulate to the roots of growing. Regular lawn core aeration can prevent lawn diseases and make grass healthier. Cores left on the lawn will break down and help to increase microbial decomposition of dead organic material (thatch). (10)

#### CULTIVATION

In turf, the working of the soil without significant damage to the turf. (10)

#### DRIFT

Associated with wind movement that can push or force weed control and pesticide chemicals beyond an intended area. When spraying a chemical care needs to be given to wind movement. Growing grass or other plants adjacent to target areas could be affected by drift. (10)

#### EMULSION

One liquid suspended in another. (10)

#### **ERADICATION**

Complete elimination of something, such as a pest, from an area or the environment. (10)

#### FERTILIZATION/FERTILIZER

An organic or inorganic material that is applied to the soil or a plant to improve its nutrient content. Organic or inorganic plant foods can be either liquid or granular. (10)

#### FERTILIZER ANALYSIS (SEE N-P-K)

The amount of each nutrient (N-P-K) in a fertilizer container expressed as percent of the total weight. For example a bag of fertilizer that reads 5-10-5 means: 5% of (N) Nitrogen, 10% of (P) Phosphorus and 5% of (K) Potassium. (10)

#### FERTILIZER BURN

Plant injury (and often death) caused by contact with high concentrations of certain fertilizers. (10)

#### FUNGAL DISEASE

Most turfgrass diseases are caused by fungi, and even though fungi are microscopic organisms, some produce larger structures at certain times in their life cycle that can be seen with the naked eye. Fungal signs include blisters on leaves, fruiting bodies, mushrooms, puffballs, pustules on leaves, spore masses, etc. (10)

#### FUNGICIDE

A pesticide used to kill fungi. (10)

#### **GRANULE/GRANULAR**

Small particles of a material. Granular formulations containing fertilizer and/or pesticide can be used in a lawn care program. (10)

#### HERBICIDE, POST-EMERGENT (POST)

A weed control agent that needs to be applied after weeds emerge in order to be effective. (10)

#### HERBICIDE, PRE-EMERGENT (PRE)

A weed control agent that needs to be applied prior to weed emergence in order to be effective. (10)

#### INFILTRATION RATE

The rate at which water is absorbed into the soil. Clay soils have low infiltration rates; sandy soils have high infiltration rates. (10)

#### **INORGANIC (FERTILIZER)**

Non-organic products used for supplying nutrients to a lawn that are immediately available for plant use following postapplication watering. (10)

#### INSECTICIDE

A pesticide used to kill insects. (10)

#### LABEL

A brief description, warning and/or directions often found on pest control products or fertilizers. (10)

#### LEACHING

The downward movement in water of pesticides and/or nutrients through the soil. (10)

#### LIME

A substance, produced by heating limestone, used in lawn care to adjust low (acidic) pH levels to encourage healthy grass. (10)

#### LIQUID FERTILIZATION

A method of applying liquid plant nutrients. (10)

#### LOW TOXICITY

Term which the Environmental Protection Agency (EPA) uses for pesticides that have low toxic levels. Toxicity is the degree of damage a substance causes to an organism. (10)

### NEMATICIDE

A pesticide used to kill nematodes. (10)

#### N-P-K

Leftover residue on a lawn that sometimes results from the use Abbreviations expressed as numbers on a fertilizer label for the primary nutrients necessary for plant growth - nitrogen (N), of herbicides or insecticides. (10) phosphorus (P), and potassium (K). Example: 5-10-15. (10)

#### **NITROGEN – SLOW RELEASE**

Slow release sources of nitrogen include organic materials broken down over time by soil microorganisms and synthetic forms of nitrogen either coated or in a complex formulation designed to slow the nitrogen release. These materials produce slow turf green-up, have a long residual, and low burn potential. (10)

#### NITROGEN – QUICK RELEASE

Quick release nitrogen is water-soluble and produces fast Any material added to the soil to improve its quality. (10) greening of turf. Quick release nitrogen sources have a short SOIL COMPACTION residual and high burn potential. (10)

#### NUTRIENT RELEASE RATE

The speed at which plant nutrients such as nitrogen (N) become available for plant use following application on a lawn. (10)

#### NUTRIENTS

Mineral elements considered essential for plant growth, (10)

#### **ORGANIC FERTILIZER**

Animal or plant products such as manures, bone meal, seaweed, alfalfa meal, compost or other plant or animal byproducts that are used for fertilizer for garden or lawn care. Organic fertilizers are slow release fertilizers, meaning they are decomposed by soil microorganisms to release nutrients gradually. They are an alternative to synthetic fertilizers. (10)

#### PARTS PER MILLION (PPM)

A way of expressing diluted concentrations of substances. Usually describes the concentration of something in water or soil by weight or volume. One ppm is equivalent to 1 milligram of something per liter of water or 1 milligram of something per kilogram soil. (10)

#### DFAT

Peat is partly decomposed plant material found in marshy areas used as fertilizer and fuel. (10)

#### PEST

Any organism considered harmful to a living plant. Major types The ability of a species of turf to withstand the application of a of pests include diseases (fundi), insects, nematodes and weeds. pesticide (herbicide, fungicide, insecticide, etc.) at the normal Other turfgrass pests include moles, voles, millipedes, mites, dosage without being killed or injured. (10) earthworms, etc. (10)

#### PESTICIDE

Any chemical (or mixture of chemicals) or biological agent used to control plant or animal pests. Pesticides include fungicides, herbicides, insecticides, and nematicides. (See fungicide, herbicide, insecticide and nematicide,) (10)

An insecticide or other pesticide formulation consisting of the active ingredient in a finely ground state combined with wetting PGR (PLANT GROWTH REGULATOR) agents and sometimes bulking agents. Wettable powders are Plant growth regulators (PGRs) are chemicals which control designed to be applied as a dilute suspension through liquid some aspect of plant growth or development. (10) spraying equipment. As wettable powders are not mixed with PH LEVEL (SOIL) water until immediately before use, storing and transporting Indicates the acidity or alkalinity of the soil. The pH scale reads the products may be simplified as the weight and volume of the from O to 14. O indicates extreme acidic soil and 14 extreme water is avoided. (11)

alkaline soil. A pH of 7 is neutral (neither acidic or alkaline). (10)

#### PHOSPHOROUS

One of the major plant nutrients: important in root growth and plant energy functions. (10)

#### POTASSIUM

One of the major plant nutrients important in maintaining general plant health, associated with improved stress and disease tolerance. (10)

#### PSI

Pounds per square inch. (10)

#### **RESIDUAL/RESIDUE**

#### SAND

A fine gritty or grainy material that can be used as a filler if soil is too soft and needs to be firmed up, or if the composition of the soil is less than desirable. (10)

#### SLOW-RELEASE FERTILIZER

A material that adds nitrates to soil at a slower pace to sustain nutrients for a longer period of time. (10)

#### SOIL AMENDMENT

Soils that are subject to heavy traffic are prone to compaction and can cause reduced drainage, increased runoff and inhibit root growth. Aeration can help alleviate compaction. (10)

#### SOIL TEST

A measurement of pH and nutrients in the soil. (10)

#### SOLUBLE (FERTILIZER)

Fertilizers that are made up of components easily dissolved in water, making them immediately available for plant use. They can result in lawn "burning" more easily than slow-release fertilizers. (10)

#### SULFUR/SULPHUR

An abundant tasteless, odorless, multivalent, nonmetallic element; best known in yellow crystals. It occurs in many sulphide and sulphate minerals and even in native form (especially in volcanic regions). Elemental sulfur is often used to lower the pH of an alkaline soil. (10)

#### TOPSOIL

The upper portion of soil that is generally high in organic matter and has favorable characteristics such as greater soil fertility and provides better aeration than subsoils. (10)

#### TOXICITY

A term used to define a material's hazard potential. (10)

#### TURF TOLERANCE

#### WEED

Any invasive, difficult or unattractive plant that grows in an area where it is not wanted. (10)

#### WETTABLE POWDER

#### WETTING AGENT

A chemical that aids in liquid-to-surface contact. (10)

#### WINTER FERTILIZATION

Application of fertilizer that is made after the turf is dormant and has lost its color for the season. Winter fertilization encourages root growth needed for turf health and density. (10)

View a complete lawn care glossary at http://www.thelawninstitute.org/pages/glossary/.