

4) Mower bounce on unlevel ground contributes to an inconsistent cut.

5) An improperly-set deck could result in scalping, which is removing an excessive amount of leaf tissue. Baikan and other turf experts recommend setting the deck so that not more than 1/3 of the leaf tissue is removed. "Scalped grass is more susceptible to pests and turf," she says.

6) Mowing stressed grass just places more stress on the plants, resulting in a bevy of problems.

7) Mowing frosted grass removes needed moisture from the plant's access.

8) Improperly maintained mowing equipment contributes to turf damage by leaking gas, oil and hydraulic fluids.

9) An excessive accumulation of clippings results in an unhealthy appearance when it dries up. She suggests collecting clippings when they show an excessive accumulation, or mowing more frequently.

10) Continually mowing in the same direction causes formation of a "grain." "You can create a pattern of beauty just by cutting in different directions," she says.

—Jerry Roche

## ATHLETIC FIELD MOWING HEIGHTS

### USE

### In-season

### Off-season

Bowling, cricket

1/4"-1/3"

1/4"-1/3"

Field hockey

3/4"-1 1/2"

2"-2 1/2"

Baseball outfield

1"-1 1/2"

2"-2 1/2"

Soccer

1"-1 1/2"

2"-2 1/2"

Rugby, lacrosse

1 1/2"-2"

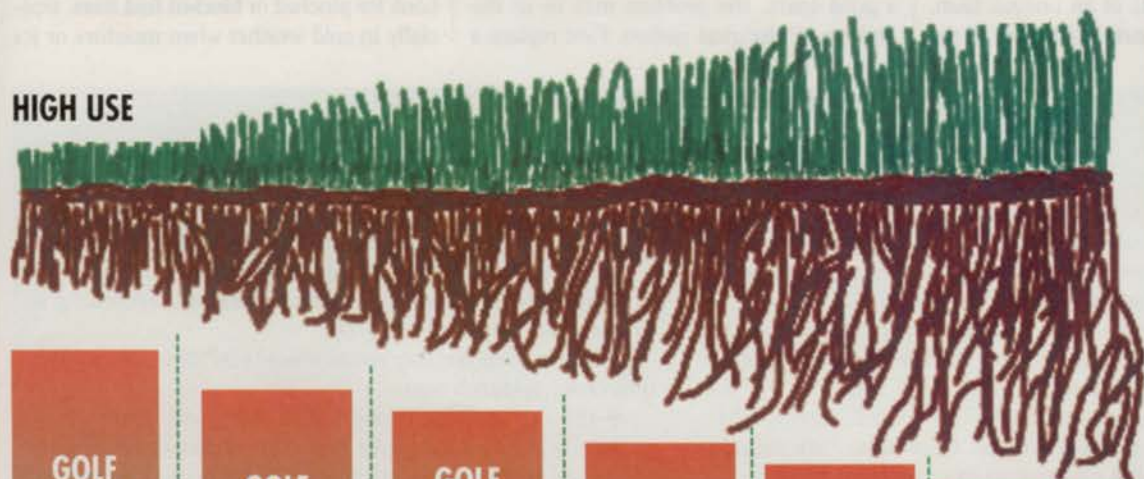
2 1/2"-3"

Source: Beth Baikan

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longer heights  
for infrequent  
mowing, avoids  
scalping



Beth Baikan:  
tip number one is  
mow at the proper  
height.



# Troubleshooting mower engines

Here are some typical mowing problems, and how you can solve them.

by Robert L. Tracinski

■ While most landscape managers probably don't think of themselves as mechanics, even the best in the business are only as good as their equipment.

By learning to recognize and correct routine mower problems quickly and efficiently, you can devote more time to the productive work.

Here are some common problems and how to get to their roots, with the key points in boldface type.

**Striping, unevenness**—Uneven cutting, skipped areas or poor performance indicates a problem with the mower deck or cutting blade.

**Wet grass** may be more prone to uneven cutting than drier turf. If possible, wait until the grass is dry before cutting. It's also possible that you're trying to do the job too fast. A **slower ground speed** may solve the problem. Also, cutting too much grass at one time often results in an uneven lawn. Try taking **less of a cut**— $1\frac{1}{2}$  inches at the

most. If the grass you're cutting is exceptionally fine, it might help to go to a **lower lift blade**.

If the problem is in the mower, you most likely have a **dull blade**. Keep the blade sharp; corners should not be rounded.

Keep the underside of the **mowing deck clean**, and inspect it to make sure that it isn't **warped or distorted**. Make sure you don't have a **bent or damaged toe guard** at the discharge chute.

If you're using a belt drive model, be sure that the **belt is properly tensioned** and that the **idler moves freely**.

**Engine won't start**—A variety of factors, from weather changes to worn parts, can contribute to hard starting.

Determine whether you're **getting a spark**. Using insulated metal pliers, remove the spark plug and touch the threaded area of the plug to a metal surface on the engine. Turn over the engine and look for a blue spark.

**Electrical problems**—If you don't have a good spark, the problem may be in the ignition or electrical system. First **replace a**

**worn or corroded spark plug**.

Next, check the **battery's electrolyte levels**, add water if necessary, and **clean the terminals**. Have the battery tested if you're still having problems.

Sometimes a problem elsewhere in the system may cause the battery to run down. Among the possibilities:

- accessories are left on after the vehicle is turned off, draining the battery;
- the vehicle has been idle for three months or more, during which time the battery has deteriorated;
- battery cables or connections are heavily corroded, leading to voltage seepage.

**Fuel problems**—Be sure you're using fresh fuel with an **alcohol content of less than 10 percent**, and the **right blend** for the season. Summer-grade fuel can be less volatile in winter, while winter blends can cause vapor lock in warmer weather.

Another culprit may be the fuel system. Check fuel flow: **pulse lines should be connected** and the **fuel vent open and clear**. Look for pinched or **blocked fuel lines**, especially in cold weather when moisture or ice

## Mulching: does it work?

■ Mark Prinster of TruGreen/ChemLawn believes that there will be a nationwide restriction on disposing of lawn debris in sanitary landfills by the mid-1990s.

Mulching grass clippings, he believes, could be a partial answer to the problem of disposal for landscape managers. But only a partial solution.

"Do mulching mowers work?" he asked, during the Georgia Turfgrass Conference last December. "We found, yes and no, depending on the type of grass."

The newer mowers with a mulching feature work well on common bermudagrass and tall fescue, but "on hybrid bermuda, the differences are not great enough to warrant use of a mulching mower," Prinster believes.

Mulching mowers were developed by Bolens in the 1960s, Prinster notes. They feature a dome-shaped deck, a special cutting blade and a powerful (4 to 5 hp) engine. The advantages of using mulching mowers:

- You return the clippings to the environment.
- You eliminate composting and dumping.
- You reduce mowing time by 38 percent, according to TruGreen/ChemLawn research.
- You reduce fertility requirements by 25 to 30 percent, university research says.
- You can mulch autumn leaves along with grass.

According to university research, grass clippings are composed of 4% nitrogen, 0.5% phosphorus, 2% potassium, 75-85% water and 20-30% protein. According to a study at Washington State University, mulched lawns were healthier than non-mulched lawns (see chart on page 14).

"The agronomic benefits of mulching are real," said Prinster. "The mulching mowers work, but they're not foolproof. We have to watch weeds because if you mulch you're returning the weed source to the turf."

— Jerry Roche

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**Some manufacturers have established a 'hot line' service to get an answer in one call.**

can form; keep the tank full in winter to prevent moisture condensation.

**Fuel deterioration**—Make sure the carburetor is clean, and compare the adjustments on your carburetor to the settings recommended in the operator's manual.

If you routinely store your mower for the winter or extended periods of time, **fuel can deteriorate**, turn to varnish and cause engine difficulty or damage. Before storing a vehicle for more than three months (less in warmer environments), it's best to remove all fuel from the system. If you must store a vehicle with fuel and without adding stabilizer, **replace the fuel and filter and remove and clean the carburetor** before use.

**Oil consumption**—If blue smoke blows from the exhaust during mowing, the engine is consuming too much oil.

If you suspect this, use the following checklist to identify the specific problem:

- **oil level** is too high: drain off the excess and keep an eye on it;
- **oil weight**: review the operator's manual for recommended weights;
- **oil foaming**: do not operate the engine above recommended speeds;
- **overheating**: refer to operator's manual for instructions on cleaning the cooling fins.

**Hydrostatic transmission**—If you have slow response from a hydrostatic transmission, steering difficulty or a slow deck lift speed, check the **oil level** according to the procedure outlined in the operator's manual. Check for moisture in the oil. Change the **oil filter** if you have problems with contamination, or if it has not been changed in the past season; if a **hydraulic filter is plugged** with debris, it will restrict oil flow. Fill the filter with the proper oil before installing it in the mower.

**Help wanted**—What if, despite your best efforts, you can't seem to locate or correct a mower problem? The next step may be to go to your dealer for help. Some manufacturers have established a "hotline" service which allows a dealer to call the manufacturer, describe a problem and get an answer in one phone call. In any case, your dealer should be able to help.

—Robert L. Tracinski is consumer information manager at Deere & Co., Raleigh, N.C.

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	<u>Color</u>	<u>Quality</u>	<u>Density</u>
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Source: Braun and Stahnke, Wash. St. Univ.

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# Coated fertilizers explained

## Manufacturers rely on polymers to improve and, in some cases, eliminate sulfur coating.

■ Turfgrass managers—and, increasingly, homeowners, too—are embracing the use of coated fertilizers.

"Coated fertilizers represent the fastest growing segment in controlled-release technology," says Harvey M. Goertz of O.M. Scott & Sons. From 1980-1990 sales of coated fertilizers grew 10 percent annually, while sales of all controlled-release fertilizers grew at a rate of 4 percent.

All of this has taken place since the Tennessee Valley Authority developed sulfur coated urea (SCU) in the 1970s. Heated granules of urea are passed through molten sulfur. Sulfur is used because of its nutrient value and its low cost.

But because sulfur eventually shrinks and cracks, the granule is also often treated with a wax sealant. Finally, the granules receive a flow conditioner to keep them from sticking together or gumming up equipment.

"One of the reasons why SCU is used as opposed to other types of controlled-release nitrogen—no matter who makes it—is that it's the most cost-effective, slow-release nitrogen source on the market today," says Dr. Bruce Augustin of Lesco.

**Better release**—SCU releases nitrogen at a steadier and more prolonged rate than

does urea because its coating partially prevents water from reaching the prill, decreasing the likelihood of surges in turfgrass growth and of "burns." More importantly, the turfgrass stays greener longer.

The nitrogen escapes into the soil through imperfections in the sulfur coating. The release rate is affected by coating thickness and quality, and, in the case of SCUs with a wax sealant, temperature also. Microbes must attack the sealant to uncover cracks in the granule.

SCU has some drawbacks. Particles with too light a coating can break and release their nutrient too soon. SCU is a statistical blend of many different coating weights

and qualities. This minimizes the effects of particles receiving too light or too heavy coatings.

**More precise**—Manufacturers say that polymer technology gives them more precise and uniform coating capabilities. Also, by using a polymer, the sulfur coating can be reduced.

"Polymer-coated fertilizer provide a higher degree of controlled release," says John Detrick of Pursell Industries. "It's much more predictable, even after lots of mechanical jostling."

Polymer-coated fertilizers aren't new. They've been around since the late 1950s, says Augustin. But today's products have only become widely available to turfgrass managers in the last two years.

Several major manufacturers market polymer-coated, controlled-release fertiliz-

ers with similar names: Polyon by Pursell Industries, Poly-Plus by Lesco, and Poly-S by O.M. Scotts. Grace Sierra's turfgrass product is known as Once, and Cedar Chemical has its Multicote (technically, resin coated).

Although similar in purpose, there are differences in these products.

**Some differences**—Pursell, for instance, uses its patented reactive layers coating (RLC) process—two co-reactive liquids polymerized to form ultra-thin coatings over a nutrient, usually urea. Detrick says the nutrient release rate, via osmosis, can be programmed by the coating thickness. Polyon is a nutrient (urea) core surrounded by polyurethane.

By contrast, both Lesco's Poly-Plus and Scotts' Poly-S fertilizers have both sulfur, for economics, and polymer coatings.

Grace Sierra and Cedar Chemicals apply oil-based resins to coat several different fertilizer substrates. For instance, Cedar's Multicote is coated potassium nitrate.

Coated fertilizers are often manufactured to specific granule sizes and coating thicknesses for specific uses:

✓ **Standard:** lawn care, homeowner, nurseries

✓ **Mini-granules:** lawn care, golf courses

✓ **Micro-granules:** golf greens

By increasing the thickness of the polymer coating, a manufacturer can produce (and probably already has) coated fertilizers that release nutrients for over a year or more. There are practical reasons, including the cost of polymers, why this isn't practical. Besides, how much fertilizer does anyone want to put down in a single application to give the turf its four or five pounds of nitrogen a year?

For a faster green-up, coated fertilizers are often sold in blends with uncoated, more readily available forms of nutrients.

—Ron Hall

### Advantages of polymer-coated fertilizers:

- More consistent nutrient release rate.
- Higher N levels available because of thinner coating.
- Less breakage during handling cutting down on premature release and dust.
- More complete release of nutrient.
- Wide range of product sizes, release rates, nutrients.

## For more information:

Cedar Chemical Corp.  
5100 Poplar Ave Ste 2414  
Memphis, TN 38137  
Circle No. 300 on Reader Inquiry Card

Grace Sierra  
1001 Yosemite Drive  
Milpitas, CA 95035  
Circle No. 301 on Reader Inquiry Card

Lesco, Inc.  
20005 Lake Road  
Rocky River, OH 44107  
Circle No. 302 on Reader Inquiry Card

O.M. Scott & Sons Company  
14111 Scottslawn Road  
Marysville, OH 43041  
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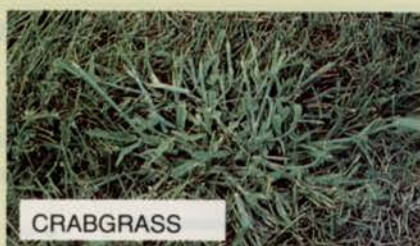
Pursell Industries  
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201 W. Fourth St.  
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environmental stewardship and reduce their chemical costs.



**Everett Mealman**  
Chairman and  
Chief Executive Officer  
PBI/Gordon Corporation

The environmental age weed control program being used by Roger Albrecht is typical of progressive turf professionals.

Albrecht is president of Nitro-Green Corporation, which has 38 lawn care franchisees scattered over 15 different states, and he manages two locations in California for his own hands-on experience.

"Our goal is to eliminate all broadcast spraying of herbicides on the ornamental turf we manage, and replace it with spot treatment as necessary," says Albrecht. "We want to be proactive on environmental issues and be able to assure our customers that we are using the absolute minimum requirement of chemicals."

Albrecht goes on to explain that such a program takes time to implement because

the turf needs to be so healthy and thick that weeds cannot easily germinate.

"The elimination of the broadcast applications of pre-emergent herbicides is the critical step," says Albrecht, "because, no matter what, some crabgrass is going to appear, and since crabgrass is a major cause of complaints, we must be able to eliminate it fast with no discoloration."

Trimec Plus provides the safety net that enables Albrecht to eventually eliminate broadcast applications of pre-emergent herbicides. "We have absolute confidence in Trimec Plus to handle any crabgrass or nutsedge that shows up," says Albrecht.

And, of course, the same spot sprayer filled with Trimec Plus that Albrecht uses to control crabgrass and nutsedge also controls the other grassy and broadleaf weeds that can germinate throughout the year. "Having one herbicide for all of our spot treatments is a major factor in our program," says Albrecht.

But if Trimec Plus is ideal for spot treatments, it is also unsurpassed for broadcast applications when the need exists. Listen to George Toma, the executive turf consultant for the Royals, Chiefs, and NFL:

"My son, Chip, the groundskeeper for the Truman Sports Complex, used broadcast applications of Trimec Plus on the out-of-sight, unirrigated perimeters of the complex which was loaded with every conceivable weed, and Trimec Plus

absolutely took out everything except the bluegrass."

According to Toma, it would have taken four different selective herbicides to do the job that Trimec Plus was able to do... but even more important, Toma says that Trimec Plus did a better job on all of the individual species than a narrow spectrum selective could have done.

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And now it is labeled for use in turf-type tall fescues and zoysiagrass, as well as established bluegrass and bermudagrass.

So, by all means, give Trimec Plus a trial this season... especially on crabgrass, nutsedge and clover. We assure you that your experience with Trimec Plus will give you the confidence you need to start working toward the elimination of broadcasting.



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HERBICIDE 771-293

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## Word to the wise:

# Watch out for OSHA citations

### OSHA Act of 1970, updated in 1991, has clout in green industry.

■ "OSHA people are not the kind of people you want to get mad," says Mary Malotke of TechneTrain, Milford, Ohio.

Pursuant to the Occupational Safety and Health Administration's (OSHA) regulations, small businesses must maintain a safe working place, especially those places that use hazardous substances like pesticides and hazardous equipment like lawn mowers.

Small businesses are subject to unannounced inspections by OSHA teams, and with the inspections could come citations for violations of the rules. The Hazard Communication and Worker Right-to-Know rules are contained in the first part of an OSHA inspection, Malotke notes.

She says that the most common OSHA citations are:

- 1) no written program
- 2) no employee training
- 3) no MSDSs for the chemicals on premises.
- 4) no in-plant container labels
- 5) MSDS file not up to date
- 6) no chemical inventory
- 7) no written chemical hazard determination (program)

**Written programs**—The key elements to a written program, the most common OSHA violation in the green industry, are:

- what you are and what you do;

- key work areas and their managers;

- the name of the person responsible for the list of chemicals and MSDS file;

- the person responsible for reviewing MSDSs and chemical lists;

- what training includes;

- who handles training;

- how new hazards are assessed; and

- protective and emergency equipment available.

**Training programs**—Training programs, the second-most common OSHA violation, should include:

- information on the Right-to-Know laws and your company's program;

- basic information on the chemicals and their physical hazards;

- how to read an MSDS and pesticide label;

- where MSDSs and the written program are kept;

- where special hazards are located; and

- protective and emergency plans and procedures.

**Facility requirements**—Malotke also says that each facility must:

- list chemicals and where they're kept;

- label all containers;

- train employees in safe handling procedures; and

- create a safe work environment with safety/protective equipment.

OSHA representatives can help you with questions, but if you ask them to your place of business, they are bound by law to cite any violations they might see.

—Jerry Roche

## Hazardous substances checklist

■ If your small business deals with pesticides or other hazardous substances, the Occupational Safety and Health Administration dictates that you follow certain rules in handling and applying any such materials.

The rules were established by the OSHA Act of 1970 to help prevent accidents in the workplace, and thus provide for the continuing safety of your employees.

The OSHA, in its publication 2209, issued a list of checkpoints for small businesses in their handling of hazardous substances. Here is that list:

- Are employees trained in the safe handling of hazardous chemicals?
- Are employees aware of the potential hazards involving various chemicals?
- Is employee exposure to chemicals kept within acceptable levels?
- Are eye wash fountains and safety showers provided in areas where the chemicals are handled?
- Are all containers labeled for their contents?
- Are all employees required to use personal protective clothing and equipment when handling chemicals?
- Are flammable or toxic chemicals kept in closed containers when not in use?
- Is the contents of chemical piping systems clearly marked?
- Is adequate means readily available for neutralizing or disposing of spills?

continued on page 22



Are employees trained in the safe handling of hazardous chemicals?



Mary Malotke: written program is number one citation.

## Government a great resource

■ The federal government's main reference for information on OSHA is:

"OSHA Handbook for Small Businesses," Pub. 2209. It is available for \$4.00 from the U.S. Government Printing Office, Supt. of Documents, Washington, DC 20402; phone (202) 738-3238.

To order "Job Safety and Health Protection" (the OSHA workplace poster), the OSHA recordkeeping requirements, a copy of the appropriate sets of standards, and other publications, contact your local OSHA Area Office. There are 85 such offices in the U.S. and its possessions.



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\*See your Jacobsen distributor for full warranty details.

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