

*Need to know what insecticide would be best to use to control chinch bugs? Or you've stumbled across some mysterious yellow patches on one of your customer's lawns and want to know what's causing them. Perhaps you're looking for tried and true ways to retain your employees or improve their performance. Look no further than our Quick Reference Technical Guide, your guide to greater knowledge and better business.*

THE INFORMATION CONTAINED IN THE FOLLOWING PAGES WAS TAKEN FROM PREVIOUS ISSUES OF LANDSCAPE MANAGEMENT.

## Winning the retention game

*How landscape managers keep their employees*

Incentives/bonuses	67.4%
Uniforms	52.2%
Retirement savings plans	38.0%
Promotions	31.5%
Transportation	28.3%
Recognition programs	23.9%
Education reimbursement	21.7%
Profit-sharing plans	19.6%
Health care programs	9.8%

## Managing your labor force



Follow this plan to cut employee turnover at your operation:

- 1 Improve the candidate-to-job match as you build your team — no square pegs in round holes.
- 2 Place a higher priority on training. Use the start-up program to “set the hook” and start building positive thoughts and feelings.
- 3 Build in some “people magnets.” Let employees do what they do well. Communicate often. Give the staff credit consistently. Share the results of success. Get out of the office and be around your people. Put some contests and fun into the job.
- 4 Give people a reason to believe. Stop flying by the seat of your pants. If you're organized and set an example, people will want to follow you because they see strong management. Talk constantly about company values and beliefs to build a sense of pride. Brag about your staff in public and in your advertisements.
- 5 Recognize and treat people as individuals. Identify individual talents and potential while you respond to their individual needs.
- 6 React to each employee's performance every day. Look for something to reward and don't send mixed signals.
- 7 Be fair to everyone. Don't play favorites. Tell your people why you want them to do it your way.
- 8 Be honest 100% of the time. Remember: If you lie, you die.
- 9 Set a positive leadership example. Put a smile on your face before you go through the door each morning. Never let the staff see you down. Positives create positives; negatives create negatives.
- 10 Balance your concern for tasks and people evenly. Try to be someone your staff just likes to be around.

## 10 reasons why they'll leave

- 1 "This job isn't what you said it would be." Translation: You either failed to explain the job requirements, or you've had smoke blown in your face during a hiring interview. Under pressure to "fill the chairs," we try to see the best in people. If you hear this phrase, you've misread the job candidate or mislead yourself.
- 2 "I just can't do this job." Translation: More than likely, there has been a failure to provide adequate start-up training or the employee is simply bored by the work.
- 3 "All we do here is work." Translation: Typically, the manager has been unable or unwilling to control work hours. This happens frequently during a bad weather spring, when we fail to eliminate long days and/or Saturday work after promising we would in the hiring interview.
- 4 "Nobody here knows what the heck is going on." Translation: From the employee's view, your operation is disorganized and inconsistent.
- 5 "All we ever hear is what's wrong." Translation: When I hear this, I usually find a manager who is totally task-oriented. When the task goals aren't met, there can be only one reason for him or her — lazy workers. This may not be true, but that's the employee's view . . . and that's the point.
- 6 "You never say thank you." Translation: Employees in this operation probably get little recognition and few rewards. Managers who don't give credit to the team and don't share rewards will lose 100% of the time.
- 7 "I don't fit in here." Translation: The workplace climate isn't people friendly. It may work for you, but what is it like for your employees?
- 8 "You always promise but never deliver." Translation: Many managers promise an employee whatever they have to just to boost productivity, then fail to deliver. They are so stressed and beaten down they see no other way to get people to work hard than to "promise the world." This is a big mistake.
- 9 "You expect us to work while you 'goof off.'" Translation: Tired managers can develop a habit of showing up for the start of the day, then disappearing (at least they believe they've disappeared) to the golf course or other activity while the staff "delivers the goods." Whether you own the business or not, employees won't tolerate what they consider lazy leadership while being pushed to the limit themselves.
- 10 "It's just no fun working here." Translation: This is a typical "exit interview" comment from employees of "task-oriented" managers. To keep people, there must be a perceived balance between the manager's concern for people and tasks. When the employee doesn't sense the balance and feels that work is the only thing management thinks about, turnover rises.

## Typical Performance Appraisal Sheet

Employee Name \_\_\_\_\_

Title \_\_\_\_\_

**Instructions:** Read over the general factors and rate each employee's performance on a scale of 0 to 10, 0 being the most unsatisfactory and 10 being the most satisfactory.

General Factors

**Quality** — accuracy, thoroughness and acceptability of work performed

**Productivity** — quality and efficiency of work produced in a specified period of time.

**Job knowledge** — practical/technical skills and information used on the job

**Paperwork** — proper timeliness, accuracy and legibility. Includes time etiquette.

**Reliability** — the extent to which a task employee can be relied upon regarding completion and followup.

**Independence** — the extent of work performed with little or no supervision.

**Availability** — the extent to which an employee is punctual, plus his/her overall attendance record. Includes overtime and/or weekend work.

**Equipment** — care, proper use, upkeep, service, safety, and appearance of equipment this employee uses.

**Safety** — the extent to which the employee adheres to company safety policies and is safety-conscious (i.e., wearing safety equipment, following designated procedures).

**Adherence to policy** — the extent to which an employee adheres to company policy, conducts him or herself, follows rules, and observes good housekeeping practices.

**Customer service** — willingness and demonstrated ability to cooperate, work, and communicate with co-workers, supervisors, subordinates, outside contacts, and customers. Includes the stability, courtesy, personal appearance and judgment demonstrated on the job.

Total point score (1 - 100) \_\_\_\_\_

Discussed with individual on \_\_\_\_\_

Employee's signature \_\_\_\_\_

Follow-up req./denied: Yes\_\_ No\_\_ On what date? \_\_\_\_

Evaluator's signature \_\_\_\_\_

Date \_\_\_\_\_

Evaluator's supervisor's signature \_\_\_\_\_

Date \_\_\_\_\_

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## Top Five Reasons H2B Workers Quit

1. Housing is too expensive. Most H2B workers can only afford \$25 per week. The H2B housing should not be a direct company rental or it would fall under HUD standards.
2. Bad attitude from the foreman or supervisors. Use of foul language drives workers away.
3. No ride to and from work.
4. No evening recreation. These men are many miles from their families.
5. "Us" versus "them" atmosphere at work. They don't feel they are part of things.

*Note: Check your local Labor Certification Office at the U.S. Department of Labor/Employment Training Administration for more information.*

## Compare costs & rates

As a lawn care operator or turf manager, you are not without various options. Newer fungicides may appear more expensive at first glance, but remember that the application rates are a lot less than the rates for older standard fungicides. For example, the rate for Compass (0.1 to 0.25 oz/1,000ft<sup>2</sup>) is approximately 90% less than that of Daconil Ultrex (1.8 to 7.8 oz/1,000ft<sup>2</sup>). Reduced rate fungicides equate to less active ingredients placed into the environment, less exposure to an active ingredient by the applicator and less storage space.

### FUNGICIDE COST COMPARISONS

Product	Rate	Spray Interval (days)	Cost per application (\$/1000 ft <sup>2</sup> )	Cost per treatment day (\$/1000 ft <sup>2</sup> )
Daconil Ultrex 82.5WDG	3.67 oz	14	2.06	0.21
Compass 50WDG	0.2 oz	21-28	3.38	0.12-0.16
Banner MAXX 1.24MEC	2 fl oz	28	3.82	0.13
Banner MAXX 1.24MEC + Compass 50WDG	1.0 oz 0.15 oz	21-28	3.60	0.13-0.17
Heritage 50WG	0.4 oz	28	8.62	0.31
Cleary's 3336 50WP	6 oz	28	7.44	0.27

## Test it yourself

If you want to be sure a product will fit your needs, test it. Wendy Gelernter, Ph.D., of PACE Consulting in San Diego, CA, says, "The only way to gain more confidence that a management system is the best for your site is to start a testing program."

Self-tests can ensure that the products and practices you choose fit your specific circumstances, conditions, site variations, equipment and management style.

- Plan your test before you begin; map out your plans
- Identify and record:

1. Objectives — "What rate will result in good pest control without damaging the foliage?" or, "How does the new product compare to a product that I have been using?"
2. Materials — products, rates, application equipment, etc.
3. Methods — dates of application and evaluation, how the evaluations were conducted, etc.
4. Observations — descriptions of visual characteristics, numerical ratings (e.g. the weight of clippings) or relative ratings (e.g. assigning estimates of performance on a scale).
5. Summary — of the answers to you questions.

Do not omit any of these components or it will be difficult to determine what happened during the test or why it happened.

► For each test, maintain an area that receives no treatment. Make sure the untreated (control) area is the same size and managed in the same way. Try to have the untreated area and testing plot next to each other, so the sites have similar conditions. And, the two areas should look the same at the start of the test, so you can easily compare the effect of the treatment.

► Size it properly. The smallest test plot recommended by Gelernter is 4 x 4 ft. For most small plot work, however, a 5-ft. by 10-ft. plot is convenient for a sprayer that applies a 5-foot-swath width. Or simply divide an area in half, leaving one half untreated and the other half treated.

Finally, once your tests are completed, don't take off your research hat. Follow an unwritten rule of grassroots product and practice testing — share your results with others.

**TURF & ORNAMENTALS**

# Know your diseases

The majority of lawn care companies do not treat for infectious diseases unless they are chronic problems. But if the disease infection becomes chronic, the first step is to identify it before making a fungicide application. For disease damage to occur, three factors must be present:

- ▶ a suitable host plant,
- ▶ environmental conditions conducive to disease development and
- ▶ a virulent pathogen.

These chronic diseases in lawn care are closely associated with the host:

— Brown patch and gray leaf spot are destructive diseases of tall fescue, perennial ryegrass and St. Augustinegrass.

— Necrotic ring spot, summer patch and dollar spot are diseases that damage Kentucky bluegrass and fine leaf fescue. These diseases are best controlled by preventive fungicide applications.

— Some diseases, such as leaf spot on Kentucky bluegrass and fine leaf fescues and red thread in perennial ryegrass, can be effectively controlled with curative fungicide applications. To reduce the number of fungicide applications, make the first application when the symptoms first appear.

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## TABLE 1. ALTERNATIVE MEDICINES FOR YOUR TURF

Though these products don't guarantee the 99% effectiveness we've come to expect from chemical pesticides, they do offer alternative control solutions when pests are not at their max.

### PRODUCT

#### MINERAL REMEDIES

**Silica** Soluble forms of silica such as potassium silicate, calcium silicate, or silicate (SiO<sub>2</sub>) can be sprayed at a rate of 7 lb. per 1000 ft<sup>2</sup>. Dick Schmidt used Kasil #1 at 20 to 40 fl. oz. per 1000 ft<sup>2</sup>. (information on the product can be found at [www.pqcorp.com/Lines/PS.htm](http://www.pqcorp.com/Lines/PS.htm).)

**Sulfur** Sulfur is an inexpensive yellow powder available through many horticulture supply houses. It can be sprayed or dusted on the foliage at a rate of 1 to 2 lbs. per 1000 ft<sup>2</sup> for control of fungal pests.

**Manganese** Microelements like manganese (not to be confused with magnesium) are usually applied as a spray solution in either the mineral or chelate form.

**Iron** Iron chelate is a safer but more expensive alternative to iron sulfate. Both forms are generally applied as a spray because of the small quantities required.

**Nitrogen** Fast-release nitrogen fertilizer can be used to grow a turf out of many pest problems. N can be sprayed as a liquid or applied as a dry granular and irrigated to activate. A rate of 1 lb. per 1000 ft<sup>2</sup> solves many problems; a half rate is recommended for delicate turf areas.

**Phosphorus** Most phosphate products take far too long to dissolve and activate to aid in pest control. Quickly soluble sources like diammonium phosphate (DAP) can be dissolved and sprayed for faster action and medicinal effects.

**Corn gluten** This livestock feed product exhibits pre-emergence activity on crabgrass and other annual weeds. It also functions as a slow-release, natural fertilizer, containing 10% N.

### HOW TO APPLY IT / WHAT IT CONTROLS

**Lawrence Datnoff found silica fights gray leaf spot**, Marty Petrovic found activity against pythium blight, and Schmidt found it works against dollar spot. In other studies, silica applications reduced brown patch disease by 10 to 20%, and also had activity on powdery mildew.

**Roy Goss found that sulfur controls Microdochium patch.** Pete Dernoeden found good control of take-all patch. Bruce Clark and Jim Murphy found a 23% to 42% reduction in take-all patch from using ammonium sulfate fertilizer. Sulfur is also used to treat powdery mildew. Goss concocted a sulfur regiment for *poa annua* control in creeping bentgrass turf, though Vargas admits, "it might do the job, but God help the patient."

**Charles Peacock and his associates discovered that foliar applications of manganese reduce brown patch disease and even bentgrass summer decline.**

**Tara McLeod, agronomist for the New Zealand Turf Institute, discovered** that monthly applications of iron sulfate at 1.7 lbs. per 1000 ft<sup>2</sup> effectively eliminated clover, slender speedwell, dandelion, and daisy from sports turf. Iron applications also control moss and cow grass and can mask the symptoms of fairy ring and yellow tuft.

**Dollar spot, rust, red thread, pink patch, anthracnose, necrotic ring spot, summer patch, melting out and leaf spot** can be reduced by nitrogen applications, according to Vargas. Nitrogen even benefits so-called "high-nitrogen diseases" like pythium and stripe smut, when applied after the disease has run its course, aiding recovery. Nitrogen can similarly help repair damage from insect outbreaks. Daniel Potter and his colleagues found it vital in promoting recovery from grubs. Legume weeds, like clover and black medic, can be reduced or eliminated by periodic nitrogen treatments.

**Regular phosphate applications reduced crabgrass and dandelion** populations to 5% from 26%, according to work by Wayne Huffine. Foliar sprays of soluble phosphate have also been shown to have a mild curative effect on brown patch disease.

**Nick Christians discovered** the herbicidal side-effects accidentally and has gone on to patent it for turf. Rates of 100 lbs. per 1000 ft<sup>2</sup> are needed for 95% crabgrass control. Work by Tom Turner has found mixed results of gluten, depending on the year, rate, and weather.

## HERBAL REMEDIES

**Salicylic acid** — Salicylic acid is the white dusting you find on the surface of many plants, most notably on the bark of aspen trees. Aspirin is a derivative of salicylic acid. It is a natural protectant in plants that shields against oxidation and stimulates healing.

**Xanthomonas** — Suspensions of Xanthomonas bacteria can be sprayed on the turf on weekly intervals or injected through the sprinkling system for control of *poa annua* (annual bluegrass).

**Schmidt has used salicylic acid to improve fitness** against disease and even to enhance frost and cold tolerance. "We buy salicylic acid by the 10-lb. bag and it's cheap," he says. His recent studies have had more success with root applications — rather than foliar.

**Japanese researchers, led by S. Imaizumi, found** reductions in annual bluegrass populations of up to 75% from certain strains of Xanthomonas. Kentucky bluegrass, bentgrass, and zoysia were unharmed. Recent work by Vargas confirmed these findings. He found additional Poa control by mixing PGR (plant growth regulator) with the bacterial suspension. Work at the University of Massachusetts found that Xanthomonas works better against the annual strain of Poa annua than the perennial strain.

## LIVE BIOLOGICAL REMEDIES

**Pseudomonas** — Michigan State University's TX-1 strain of Pseudomonas can be injected via a BioJect appliance into the irrigation system for disease suppression.

**Nematodes** — Seven different strains of beneficial nematodes are available for control of insect pests. Nematodes are microscopic pinworms, applied alive, that parasitize certain insect pests. However, when sprayed on, most will dry out and die. Granular applications are preferable. (A list of suppliers can be found online at

<http://edis.ifas.ufl.edu/pdf/IN/IN09600.pdf>)

**Pseudomonas bacteria has shown activity against dollar spot, brown patch, and pythium diseases.** It also shows minor activity against anthracnose, leaf spot, take-all patch, bermudagrass decline, necrotic ring spot, summer patch, pink snow mold, and gray leaf spot, according to Vargas. However, under severe disease pressure, fungicides are still required. Graham Davis reported a 27 to 33% reduction in dollar spot severity from TX-1, when tallied across an entire growing season.

**Nematodes are effective against** grubs, mole crickets, caterpillars, and soil inhabiting larva. Beneficial nemas are particularly "host specific," meaning that a given strain of nematode is picky, preferring certain insect pests over others. Be sure to get the right strain for your intended critter.

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**FUNGICIDES**

Table 1. Fungicides labeled for residential lawns

Pathogen	Fungicides	Rates (oz/1,000 ft <sup>2</sup> )
<b>Brown Patch</b>	Azoxystrobin (Heritage 50WG)	0.2 — 0.4
	Flutolanil (ProStar 70WP)	1.5 — 3.0
	Thiophanate-methyl (Cleary's 3336 50WP)	2.0
	Trifloxystrobin (Compass 50WG)	0.1 — 0.25
<b>Dollar Spot</b>	Fenarimol (Rubigan 1AS)	0.75
	Myclobutanil (Eagle 40WP)	0.5 — 1.2
	Propiconazole (Banner MAXX 1.3 MEC)	1.0 - 2.0
	Thiophanate-methyl (Cleary's 3336 50WP)	2.0
	Triadimefon (Bayleton 50WP)	0.5
<b>Gray Leaf Spot</b>	Azoxystrobin (Heritage 50WG)	0.2 — 0.4
	Thiophanate-methyl (Cleary's 3336 50WP)	4.0 — 8.0
	Trifloxystrobin (Compass 50WG)	0.15 — 0.25
<b>Leaf Spot (Melting out)</b>	Azoxystrobin (Heritage 50WG)	0.2 — 0.4
	Thiophanate-methyl (Cleary's 3336 50WP)	4.0 — 8.0
	Trifloxystrobin (Compass 50WG)	0.1 — 0.2
<b>Necrotic Ring Spot</b>	Azoxystrobin (Heritage 50WG)	0.4
	Fenarimol (Rubigan 1AS)	4.0 — 8.0
	Myclobutanil (Eagle 40WP)	1.2
	Thiophanate-methyl (Cleary's 3336 50WP)	4.0 — 8.0
	Propiconazole (Banner MAXX 1.3 MEC)	4.0
<b>Red Thread</b>	Azoxystrobin (Heritage 50WG)	0.2 — 0.4
	Fenarimol (Rubigan 1AS)	8.0
	Myclobutanil (Eagle 40WP)	0.6 — 1.2
	Triadimefon (Bayleton 50WP)	0.5 — 1.0
	Thiophanate-methyl (Cleary's 3336 50WP)	2.0
	Propiconazole (Banner MAXX 1.3 MEC)	1.0 — 2.0
	Trifloxystrobin (Compass 50WG)	0.1 — 0.2
<b>Summer Patch</b>	Azoxystrobin (Heritage 50WG)	0.4
	Fenarimol (Rubigan 1AS)	4.0 — 8.0
	Myclobutanil (Eagle 40WP)	1.2
	Triadimefon (Bayleton 50WP)	2.0
	Thiophanate-methyl (Cleary's 3336 50WP)	4.0 — 8.0
	Propiconazole (Banner MAXX 1.3 MEC)	4.0
	Trifloxystrobin (Compass 50WG)	0.2 — 0.25

## COOL- AND WARM-SEASON INSECT PESTS

INSECT	WHERE TO FIND THEM	DAMAGE SYMPTOMS	CONTROL PRACTICES
<i>Warm-season insect pests</i>			
<b>Cutworms/Armyworms</b> <i>Scouting: Soap flush</i>	Warm-season grasses	Turf clipped at soil level; large bare areas	<ol style="list-style-type: none"> <li>1. treat late in day.</li> <li>2. do not mow or remove clippings for 1-3 days;</li> <li>3. may be present from early spring to late fall</li> </ol>
<b>Fire ants</b>	Warm-season grasses	Unightly mounds that may damage mowers, painful stings a problem in high-traffic areas	<ol style="list-style-type: none"> <li>1. control in spring and fall when workers forage for food;</li> <li>2. labor-intensive mound treatments are most effective;</li> <li>3. use continuous control once you start;</li> <li>4. do not disturb mounds in treatment;</li> <li>5. use baits before using contact insecticides (they return baits to mound)</li> </ol>
<b>Mole crickets</b> <i>Scouting: Soap flush</i>	Bahiagrass, close-cut turf	Tunneling, dieback, thin spots	<ol style="list-style-type: none"> <li>1. treat in June/July when eggs hatch;</li> <li>2. follow-up treatments usually needed;</li> <li>3. Watch adults in March/April to pinpoint egg hatch areas</li> </ol>
<b>Ground pearls</b> <i>Scouting: Dig 2-4 in. in soil, sift and look for "pearls"</i>	Bermudagrass, centipedegrass	Yellowing, turf dieback, no new regrowth the following season	<ol style="list-style-type: none"> <li>1. no known effective controls;</li> <li>2. manage for turf tolerance;</li> <li>3. irrigate during dry weather</li> </ol>
<b>Southern chinch bugs</b> <i>Scouting: Look for nymphs under leaf sheath; use a cylinder pressed into ground, filled with water, to watch for floating bugs</i>	All warm-season grasses, especially St. Augustinegrass	Yellowed turf, turning reddish brown	<ol style="list-style-type: none"> <li>1. avoid overfertilizing;</li> <li>2. manage thatch;</li> <li>3. irrigate in dry spells;</li> <li>4. apply pesticides with plenty of water;</li> <li>5. multiple treatments often needed</li> </ol>
<b>Twolined spittlebugs</b> <i>Scouting: Look for spittle masses near base of plant; count nymphs in spittle masses</i>	Warm-season grasses	Yellowed turf, unsightly "spittle masses"	<ol style="list-style-type: none"> <li>1. control adults on ornamentals like hollies;</li> <li>2. treat on cloudy days when bugs are higher up on turf;</li> <li>3. start monitoring in early summer</li> </ol>
<b>White grubs</b> <i>Scouting: Dig sod squares 4- to 6-in. deep to detect grubs (will be closer to surface after rain)</i>	Warm-season grasses	Drought stress and turf dieback, may attract hungry moles or skunks	<ol style="list-style-type: none"> <li>1. treatments most effective late Aug./early Sept.;</li> <li>2. grubs like low-cut, high maintenance turf;</li> <li>3. avoid ornamentals attractive to adult Japanese beetles or green June beetles</li> </ol>
<b>Bermudagrass mites</b> <i>Scouting: Use hand lens to see small worm-like mites on grass and under leaf sheath</i>	Bermudagrass	Yellowing of leaf tips, then shortened internodes for tufted growth, death	<ol style="list-style-type: none"> <li>1. irrigate during dry spells;</li> <li>2. proper fertilization helps turf outgrow damage;</li> <li>3. use resistant cultivars;</li> <li>4. multiple treatments often needed</li> </ol>
<b>Bees &amp; wasps</b>	All turf types	Holes, mounds, tunneling in turf, visible flying insects	<ol style="list-style-type: none"> <li>1. maintain healthy, lush turf;</li> <li>2. mulch under shrubs and trees and keep it fresh to discourage nesting</li> </ol>



# ► Insects / LM's Quick Reference Technical Guide

INSECT	WHERE TO FIND THEM	DAMAGE SYMPTOMS	CONTROL PRACTICES
<i>Cool-season insect pests</i>			
<b>Japanese beetle</b>	Sandy, loamy soils	Soil samples to count population	<ol style="list-style-type: none"> <li>1. determine species;</li> <li>2. target and time controls accordingly;</li> <li>3. water in grub insecticide thoroughly in irrigated turf</li> </ol>
<b>European chafer</b>	Poorly irrigated turf	Soil samples to count and identify population	<ol style="list-style-type: none"> <li>1. determine species;</li> <li>2. less susceptible to insecticides than most other grub species;</li> <li>3. target and time controls accordingly;</li> <li>4. water in grub insecticide thoroughly</li> </ol>
<b>Oriental beetle</b>	Turf in the Northeast United States	Look in hot/dry soils a few weeks ahead of Japanese beetles	<ol style="list-style-type: none"> <li>1. less susceptible to insecticides so time carefully;</li> <li>2. may need a followup treatment;</li> <li>3. water in grub insecticide thoroughly</li> </ol>
<b>Asiatic garden beetle</b>	Turf in the northeast United States	Soil samples to find tiny grubs	<ol style="list-style-type: none"> <li>1. may be less sensitive to many turf insecticides and can establish in place of other grubs controlled by these products;</li> <li>2. just a nuisance, but that could change;</li> <li>3. water in grub insecticide thoroughly</li> </ol>
<b>Northern masked chafers</b>	Roots and organic matter	Look for broken off roots or damage to root hairs	<ol style="list-style-type: none"> <li>1. determine species;</li> <li>2. target and time controls accordingly;</li> <li>3. most turf insecticides work reasonably well</li> </ol>
<b>Little billbug</b>	Turf in eastern and midwestern United States	Target emergence from hibernating sites before they lay eggs	<ol style="list-style-type: none"> <li>1. determine species and appropriate timing;</li> <li>2. target emergence;</li> <li>3. can use degree-day model;</li> <li>4. applications at larvae stage not as successful</li> </ol>
<b>Bluegrass billbug</b>	Predominant species in eastern United States	Target emergence from hibernation before they lay eggs	<ol style="list-style-type: none"> <li>1. determine species and timing;</li> <li>2. target emergence;</li> <li>3. can use degree-day model;</li> <li>4. applications at larvae stage not as successful;</li> <li>5. may use endophyte-enhanced turf cultivars</li> </ol>
<b>Uneven billbug</b>	Turf in eastern United States	Active adults in early spring and late fall	<ol style="list-style-type: none"> <li>1. determine species and timing;</li> <li>2. target emergence;</li> <li>3. treat accordingly;</li> <li>4. applications at larvae stage not as successful</li> </ol>
<b>Denver billbug</b>	Turf in Rocky Mountains and northern Plains states	May overwinter as medium/large larvae or adults	<ol style="list-style-type: none"> <li>1. determine species and timing;</li> <li>2. target emergence;</li> <li>3. treat accordingly;</li> <li>4. applications at larvae stage not as successful</li> </ol>
<b>Hairy chinch bugs</b>	Midwest and mid-Atlantic areas	Damage occurs when turf has heat or moisture stress	<ol style="list-style-type: none"> <li>1. identify chinch bugs;</li> <li>2. apply appropriate insecticides;</li> <li>3. damage may still remain, especially if turf is in summer dormancy;</li> <li>4. may use endophyte-enhanced turf cultivars</li> </ol>
<b>Webworms</b>	Several species in northern United States	Damage may be severe or sporadic; may not need attention	<ol style="list-style-type: none"> <li>1. treatments most effective 2 to 3 weeks after peak moth flight;</li> <li>2. timing reaches small, susceptible caterpillars as they become active;</li> <li>3. endophyte-enhanced turf cultivars are resistant to some species</li> </ol>

\* Check with your county cooperative extension agent for insecticide recommendations

## Common turfgrass insecticides currently under FQPA review:

**Common name:** *acephate*

**Examples of trade name:** Orthene

**Class:** OP

**Pests commonly treated:** mole crickets, caterpillars, fire ants

**Common name:** *bendiocarb*

**Examples of trade name:** Turcam

**Class:** carbamate

**Pests commonly treated:** white grubs, chinch bugs

**Common name:** *carbaryl*

**Examples of trade name:** Sevin

**Class:** carbamate

**Pests commonly treated:** caterpillars, white grubs, chinch bugs

**Common name:** *ethoprop*

**Examples of trade name:** Mocap

**Class:** OP

**Pests commonly treated:** mole crickets

**Common name:** *isofenphos*

**Examples of trade name:** Oftanol

**Class:** OP

**Pests commonly treated:** white grubs, mole crickets, billbugs, chinch bugs

**Common name:** *trichlorfon*

**Examples of trade name:** Dylox

**Class:** OP

**Pests commonly treated:** white grubs

RICK BRANDENBURG, PH.D., TURFGRASS ENTOMOLOGIST,  
NORTH CAROLINA STATE UNIVERSITY

### SOME BIORATIONAL CONTROL OPTIONS

BRAND	PROBLEM
Avid	leafminers, mites
Azatin	broad spectrum IGR
BioNeem	broad spectrum IGR
Conserve	caterpillars, larvae of leaf-feeding beetles and sawflies
DiTera	nematicide
Match	caterpillars
Merit	grubs, leaf miners, aphids, etc.
Neemazad	broad spectrum IGR
Mach2	IGR
Hexygon	miticide
insecticidal soaps horticultural oils	
Heritage	fungicide
BioTrek	biological fungicide
Spot Less	biological fungicide

# MULCH IN MINUTES



- **DAYS BECOME MINUTES . . .** with the easy, one person, remote controlled Express Blower application.
- **FINISH IN A FLASH . . .** with a production rate of 30 to 100 cubic yards per hour, large crews are a thing of the past.
- **SEASONED WITH TIME . . .** EB is the industry leader with over 5 decades of mulch, compost & soil application technology and experience.
- **SERVICE IN SECONDS . . .** with a customer support team that is available and ready to assist, 24 hours a day.



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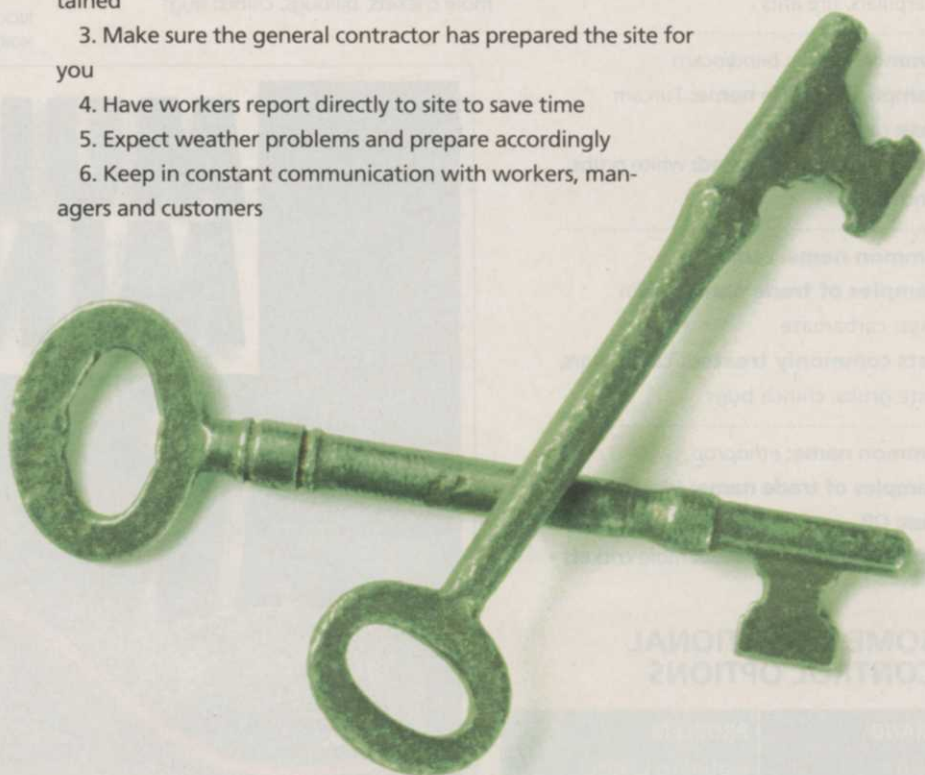
**Express Blower**

[www.expressblower.com](http://www.expressblower.com)

A division of Rexius Forest By-Products, Inc., Eugene, OR

## Keys to an efficient operation

1. Know the project inside and out before arriving at the site
2. Make sure all materials are ordered and equipment is obtained
3. Make sure the general contractor has prepared the site for you
4. Have workers report directly to site to save time
5. Expect weather problems and prepare accordingly
6. Keep in constant communication with workers, managers and customers



## 15 ways to build your operation

- Educate yourself; become a business person.
- Arrange for enough money to operate in a smooth manner.
- Price to make your services profitable, not just to get business.
- Have a plan for growth and stick to it. Extra business may sound good, but if you overextend yourself or lose money on the work, what is the gain?
- Sell only enough business you can reasonably handle.
- Learn to delegate; you can't do it all.
- Get involved with other landscape professionals.
- Have realistic expectations.
- Diversify your customer base.
- Focus on your key services.
- Understand and maintain good cash flow.
- Focus on people.
- Be 'in' the business; take it seriously.
- Always try to improve.
- Make sure key players are trustworthy.

## Two sides of the "contractor" coin

We combed our research to develop two profiles of "typical" landscape managers. For comparison, we selected data of small organizations (revenues less than \$100,000) and larger ones (revenues over \$500,000) from our Penn survey. Both could describe themselves as "landscape contractors."

	Joe Lawn Service	Dan Green Guy
Company revenues	Less than \$100,000	More than \$500,000
Services offered (by rank)	Mowing Landscape construction Turf aeration	Landscape construction Mowing Turf fertilization
Customer mix	Residential – 67% Commercial – 25%	Residential – 55% Commercial – 41%
Years in operation	5 to 10 years	11 to 20 years
Location	Northeast or Midwest	South
Expect increased revenue for 2001?	Yes – 61%	Yes – 72%
Expect higher prices for 2001?	Yes – 69.2%	Yes – 71.4%
What are your top 3 challenges in business?	Growth management – 66.7% Labor availability – 54.8% Financing availability – 42.9%	Labor availability – 84.8% Developing field supervisors/ foremen – 78.8% Growth management – 51.5%
Hourly rate for employees	Best employee – \$12/hour New employee – \$8/hour	Best employee – \$18/hour New employee – \$8/hour
Number of employees	Full time – 4 Part time – 4	Full time – 30 Part time – 13
Employee retention programs used	Incentives/bonus – 74.1% Transportation – 37% Uniforms – 37% Retirement plan – 29.6%	Incentives/bonus – 66.7% Uniforms – 60% Retirement plan – 60% Promotions – 43.3%
Full time mechanic?	No	Yes
Have a Web site?	Yes – 9.3%	Yes – 33.3%
Highest level of education	High school graduate	Bachelor's degree
1999 personal income	\$61,889	\$95,174
Hours worked per week	55	64
Age	40	42
Years in industry	15	21

## On-site risks to avoid

Based on the observations of loss control specialists, we've listed three of the most common office site risk factors, along with advice on how to correct potential problems.

**1. Wet surfaces/floors.** Uneven surfaces, walks, holes and changes in level are major sources of "slip and fall" injuries, both indoors and outdoors. Wet areas made slick by frequent watering and algae growth are also a problem. To cut down on the possibility of these injuries,

- ▶ post warning signs in slippery areas,
- ▶ level uneven areas and fill in holes,
- ▶ fence areas that can't be leveled,
- ▶ treat walking surfaces to reduce algae growth, and
- ▶ routinely inspect walkways.

**2. Cluttered aisles and walkways.** Hoses left in walkways, as well as trees and shrubs that protrude, are tripping hazards. Bags of seed and/or fertilizer and storage pallets also present safety hazards for employees and others. To prevent these types of injuries, you should:

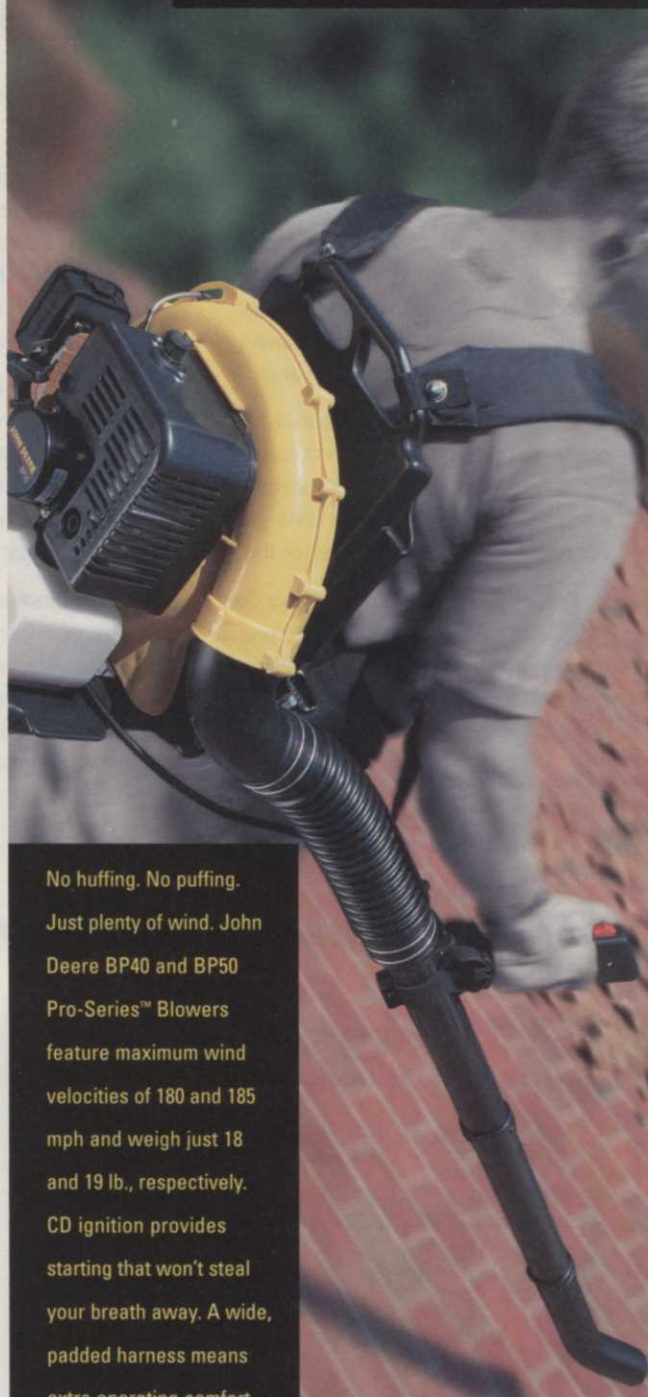
- ▶ check walkways on a daily basis to be sure they are clear of obstacles,
- ▶ be certain hanging items above walkways and doorways are secure and out of reach, and
- ▶ make sure tool storage areas are secure

**3. Poor electrical wiring.** Poor wiring is one of the biggest causes of fires. The most common electrical violations found are temporary wiring situations, excessive use of extension cords (including those made of "Romex" wiring) and improper splicing. To prevent the possibility of an electrical fire, heed the following advice:

- ▶ Have your electrical system inspected by a professional electrician
- ▶ Join wires by standard twist connectors. Wires that are twisted together can loosen and arc, which generates heat and more arcing, potentially causing a fire
- ▶ Check extension cords to ensure they can handle the load they're carrying
- ▶ Do not place extension cords under carpets: Cords can break down from constant foot traffic and can smolder undetected, potentially causing a large fire
- ▶ Never plug one extension cord into another
- ▶ Be certain that all joints are inside a junction or receptacle box
- ▶ Keep breaker and service boxes away from wet walls and protect them from leaks

John Deere Pro Series

## Big, Bad Wolf



No huffing. No puffing.  
Just plenty of wind. John Deere BP40 and BP50 Pro-Series™ Blowers feature maximum wind velocities of 180 and 185 mph and weigh just 18 and 19 lb., respectively. CD ignition provides starting that won't steal your breath away. A wide, padded harness means extra operating comfort. Pro-Series blowers. Available only from your servicing John Deere dealer.

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## 10 trends impacting the industry

Whether the economy continues to expand or slow, these 10 trends won't change. Here they are:

**1. "Easy" growth** – It's not only fairly easy to grow an operation, it's sometimes a real challenge to limit growth. Survey respondents named landscape design/installation the fastest growing segment, followed by maintenance.

**2. Uncertainty about the future** – Is the economy cooling? Will it affect construction, disposable income for consumers and commercial maintenance budgets? It's hard to prepare for this.

**3. Consolidators are getting it together** – While the rate of consolidation has slowed, the consolidated companies are starting to standardize operations and bring on some real competition.

**4. New, tougher competition** – New competitors enter this market constantly, making competition tough and squeezing prices, particularly in the

maintenance side of the business. This won't stop.

**5. Demanding customers** – Blame it on instant messaging if you like, but today's residential and commercial customers are much more fussy and pushy about getting "extras" in a deal. And they want it now!

**6. Ouch! Lack of labor hurts** – Labor shortages are a fact of life and there is no solution on the horizon. Some organizations make the most of the situation with good management, benefits and mechanization.

**7. Regulations with bite** – Key issues challenge landscapers around the country, including: availability and use of pesticides; blower noise and engine exhausts; ozone-alert restrictions; control of irrigation installation; and water restrictions.

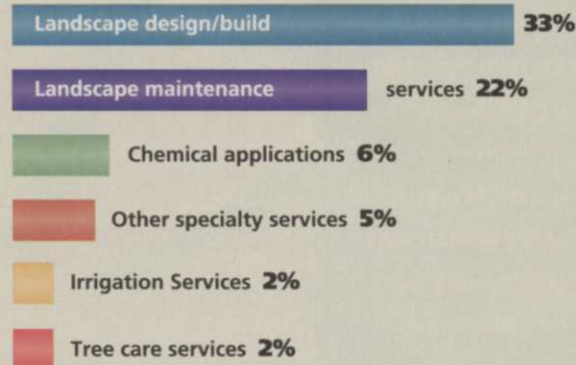
**8. Diversity in services and customers** – Innovative contractors and LCOs are expanding into new areas, franchising new services and seeking employees from new sources.

**9. Supply chain blues** – Manufacturers are merging at a dizzying rate, the ABT seed consolidation's fallout has yet to fall out and dealer/distributor chains continue to confuse and frustrate industry professionals. This will continue as long as mergers and acquisitions are profitable.

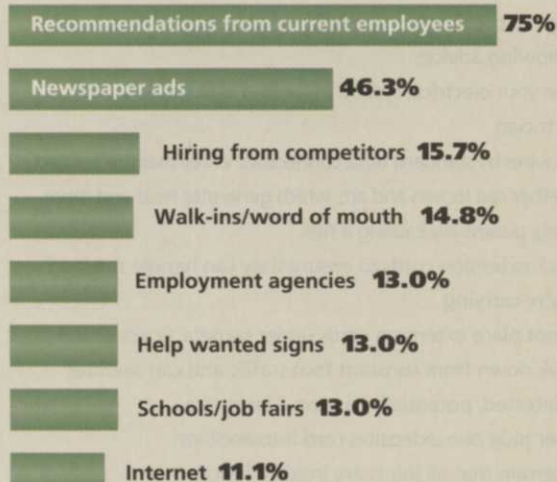
**10. High-tech goes "green"** – Laptops, palm devices, digital photography, new software and the Web continue to attract the attention of tech-savvy landscape managers. But how many are mechanizing for better productivity?

### Fastest growing service segments

(percent chosen as fastest growing business segment):



### How you recruit employees



## MAJOR FERTILIZER PRODUCTS (NITROGEN AVAILABILITY)

Type:

Soluble nitrogen	Coated soluble nitrogen	Natural organic nitrogen	Reacted (synthetic) organic nitrogen
	Sulfur coated urea (37 to 39% N)	Activated sewage sludge (6% N)	Ureaform (38% N)
Ammonium sulfate (21% N)	Polymer coated urea (38 to 44% N)	Digested sewage sludge (2% N)	Methyleneurea (40% N)
Urea (46% N)	Polymer coated sulfur coated urea (38 to 39% N)	Fish meal (10% N) Dried blood meal (12% N) Composted turkey manure (10% N)	Liquid methyleneurea (15 to 21% N) Isobutylidenediurea (31% N)

## CHARACTERISTICS OF NITROGEN

Quick-release sources	Coated slow-release sources	Reacted slow-release sources
Soluble in water	Slowly soluble in water	Controlled solubility in water
Can be used immediately by plants, which show rapid response	Can be used less frequently	Supplies N gradually
High potential for foliar burn	Reduced fertilizer losses from leaching	Little fertilizer losses from leaching
Require applications at low rates, frequent intervals to sustain growth	Produce more uniform growth response	Low salt index, little burning
Leach readily	Economically sound for general turf applications Susceptible to breaking/damage with handling	Performance not affected by coating



**COMPARISON OF MAJOR NITROGEN SOURCES**

Characteristics	Methyleneurea	Ureaform	IB**	SCU	Polymer Coated	Urea
Release characteristics	12-16 weeks	12-16 months	12-16 weeks	Varies	Varies	1-4 weeks
Hydrolysis releasable	*		*	*		*
Microbial releasable	*	*				
Not dependent on coating or particle size for release	*	*				*
Nonburning	*	*	*	☆☆	☆☆	
Low salt	*	*	*	*	*	
Minimal leaching/volatilization	*	*	*	*	*	
Temperature response	*	*			*	

\* Can cause mottling if coating is broken

\*\* IB is a registered trademark of Lebanon Seaboard Corp.

**U.S. MANUFACTURERS AND  
PRIMARY DISTRIBUTORS  
1998 CONSUMPTION (DOLLARS)**

*Estimated wholesale of the U.S. CRF market by product type, 1998*

Product	% share	\$ Dollars (Millions)
UF fertilizers	43	\$142.2
IBDU*	2	8.3
Sulfur coated & polymer coated	16	52.5
Polymer coated	22	74.4
Other slowly soluble products	5	16.4
Processes natural organic	12	40.6
Total	100	\$334.3

SOURCE: CONTROLLED RELEASE FERTILIZERS, JUNE 1999, AGINDUSTRIES RESEARCH & CONSULTING, INC., SAN MATEO, CA.