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Superintendent  
Alvarado Country Club  
Lawrence, Kansas

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John Freeman  
Superintendent  
Dearwood Country Club  
Kingwood, Texas

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# THE COMING OF WINTER

## Chemicals, irrigation systems and equipment must be carefully prepared to cope with sub-freezing temperatures in the northern U.S.

■ It's November, and winter is just around the corner, for those parts of the country that have such worries.

If you're anticipating snow, freezing temperatures and a general cessation of business in the coming months, you'll probably want to winterize the plants in your care to avoid low-temperature damage. However, just as important are chemicals, irrigation systems and equipment because they, too, can also be damaged by low temperatures and/or long storage. So here are some ways you can make sure you'll be ready to get back to work next spring.

### CHEMICALS

Any properly constructed and approved chemical storage structure will provide protection for granules and dry formulations. Only a heated storage facility should be used for liquids.

Always try to plan your purchases so that you minimize the amount of material you might have to carry over to the next season.

Never store pesticides with food, feed, drugs or clothing.

**Granules**—Bags must be kept dry. Any opened bags remaining would probably be best used before winter. Open bags can allow active ingredient to volatilize and escape. Protect from extremely high temperatures. Try to cover the bags with a protective plastic sheet. Always store them up off the floor, at least on a pallet.

**Wettable powders, dry flowables, dispersible granules**—Protect from extremely high temperatures, moisture and direct sunlight. Some packaging could be damaged by water. Keep in clean, dry area out of sunlight, also off the floor.

**Liquids**—Whether they are petroleum- or water-based, liquids need to be protected from freezing conditions. Under low temperatures, the active ingredient can "salt out" or precipitate

and it may be difficult to get it back into suspension or solution. Worse yet, you may not realize that it precipitated and pour only carrier or highly concentrated active into your spray tank next spring. Freezing of water-based formulations could rupture the container.

*Source: Doug Carlson, DowElanco*

### IRRIGATION SYSTEMS

Irrigation systems must be completely drained and shut down to prevent damage due to freezing water.

Golf course and large commercial systems need a high volume air compressor. To avoid damage to PVC pipes, use a length of 1½- or 2-inch galvanized pipe to dissipate the compressor heat prior to entering the irrigation pipes.

- 1) Close the main water supply valve.
- 2) Connect the air compressor (800 cfm or larger with pressure regulator adjusted to the lowest possible pressure, which will adequately remove water from the system).
- 3) Open drain valves and/or quick coupler valves at the far end of the system, maintaining air pressure on the system. The key is air volume (cfm) not pressure.
- 4) When all water has been drained, close drain valves and/or remove the quick coupler.
- 5) Activate each automatic valve manually from the controller, allowing each valve to remain on until all water has been expelled.
- 6) Electric valve-in-head and hydraulic normally closed systems need a minimum air pressure of 35 psi at the head to activate the valve and may require additional time to open.

**Electro-mechanical controllers:** Some are equipped with a heater resistor designed to generate heat within the timing mechanism compartment. In most areas of the country, where this heat will prevent condensation and rust formation, the AC power should remain on at the

controller while disabling the timing mechanism by placing the manual/automatic switch into the manual position.

**Solid state controllers:** Moisture can present a very costly problem. Due to varying climatic conditions, contact your distributor for winterization recommendations.

*Source: The Toro Co.*

### VEHICLES

**Battery**—Remove the battery and clean it. Store in upright position. Maintenance-free batteries should be stored in a cool, dry place. Storage above 80 degrees increases self-discharge. If wet batteries are discharged, the electrolyte will freeze when stored below 20 degrees. The battery should be checked every 60 to 90 days and recharged if necessary.

**Tires**—Clean tires thoroughly. Tires should be checked at regular intervals and reinflated as necessary to keep them at recommended pressure. Store so tires are protected from the sunlight.

**Radiator**—If storing more than a few months, drain the coolant. Open cock at bottom of radiator and remove pressure caps to drain water completely. Leave cock open. Hang a "no water" note on pressure cap. Since water may freeze, it is very important no water is left in the machine.

**Tractors with wing mowers**—Store outrigger and wing units in the raised position. Tie mowers up to relieve strain on hydraulic system. Front and center units are stored in the lower position on blocks so weight is not on tires.

*Source: Larry Evans, Lawn & Turf*

### ENGINES

- 1) Operate until fuel is completely consumed.
- 2) Drain the fuel from the tank, then backflush the in-line fuel filter.
- 3) While the engine is still warm, drain the oil from the crankcase and refill with fresh oil.
- 4) Clean the engine's exterior. Paint exposed metal or lightly coat with rust-preventive oil.
- 5) Store in dry and protected place.

*Source: Larry Evans, Lawn & Turf*



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## Sand, silt and clay: the soil minerals

**By understanding the properties of soil texture classes, you are better able to develop management strategies best suited to soil limitations.**

by Dr. Charles H. Darrah III  
CLC Labs

■ Sand, silt and clay are the major solid components of soils.

A volume of soil is typically composed of the approximate percentages seen in Fig. 1 on page 26. However, these proportions may change considerably as they are modified by adding organic matter, tilling, irrigating, becoming compacted, and otherwise influenced by man.

The mineral portion of soils is made up of weathered rock called parent material. The chemical nature of parent material varies greatly. The many natural forces, called weathering, that degrade parent material into soil also vary greatly. These two factors account for the vast differences in soils.

Soil with particle sizes less than 2mm is classified into sand, silt and clay. The USDA has established a classification of sizes. However, they are not the same as the American Society of Testing Materials (ASTM) classification system used by civil engineers.

Landscape and topsoil suppliers often run into difficulty meeting topsoil specifications when the ASTM system is used.

**Clay**—The smallest particles in soils are called clay. Individual clay-size particles are only visible under an electron

microscope.

Because they are so small, they are the source of the more important soil chemical properties. Clays play a major role in the retention and release of plant nutrients. They also help to retain and stabilize the beneficial products of organic matter decomposition called humus.

Because clay particles are so small and have very large surface areas, they retain water very well. They have a high water-holding capacity. However, because of the small size and surface area of clays, most of the water in a clay soil may not be available to plants.

In the landscape, clay soils often display droughty tendencies because of their low water infiltration rate and low available water content.

Clay particles tend to be sticky. In urban soils and sports turfs, this frequently leads to compaction. Compacted soils have a high mineral content per unit volume, while water and air content decreases to a point where turf and ornamental plants my no longer survive.

**Silt**—Silt particles are intermediate in size. Likewise, their chemical and physical properties fall between those of clay and sand. Silts retain and release fewer plant nutrients into the soil solution than clays. However, silty soils are still considered quite fertile.

Silt particles tend to be spherical in shape. Because of their size and shape, silts readily retain water. But unlike clays, a larger amount of this water is available to plants. Silts have less tendency to be sticky and therefore break up more easily under cultivation.

Compared to clay soils, silts are easier to work into a seedbed and are less likely to form a crusty surface. Aeration cores break down more readily and silty

soils are less sticky and easier to work with when wet.

**Sand**—Sands are the largest of the soil particles. They range in size from 2mm down to 0.05mm and are essentially undecomposed parent material.

Some sands may be rich in certain plant nutrients, but most are very low. Sands generally have a very poor ability to retain nutrients applied as fertilizers. Therefore, sandy soils are best managed by light frequent applications of fertilizers or by using slow-release fertilizers.

Sands typically have poor moisture-holding capacity and drain freely. However, most of the water they hold is readily available to the plant. Sandy soils tend to be droughty and have a high irrigation requirement. An important physical aspect of sands is their ability to resist compaction and retain adequate pore spaces for air and water.

How well a sand maintains the proper balance of air and water depends on the distribution and uniformity of particles within the sand size range. Specifications for golf greens and rootzone mixes call for a very specific sizing of sands and a high degree of uniformity within these size ranges.

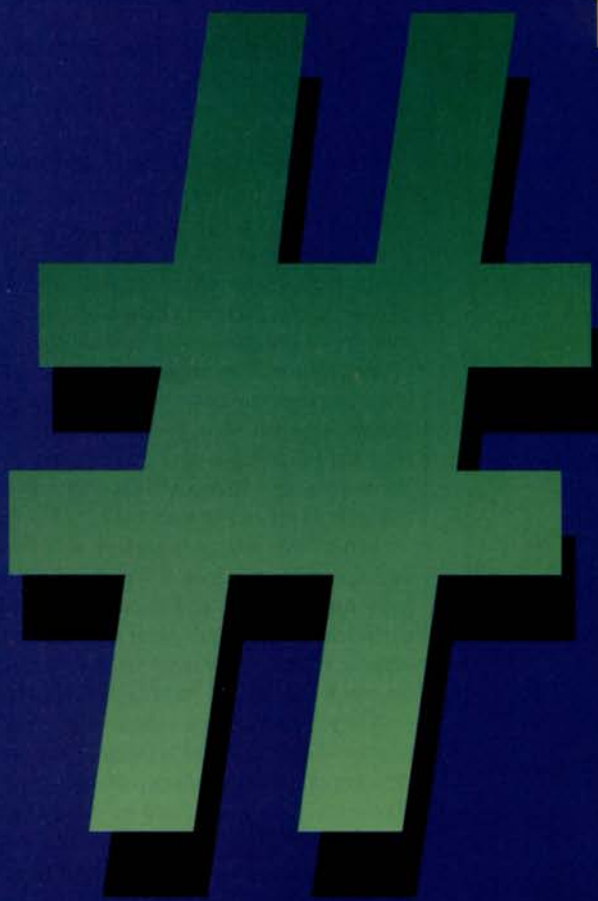
When clayey or silty soils are amended with sand, the physical properties of the soil typically worsen. However, if the correct size, uniformity and quantity of sand is used, soil physical properties can be improved. A physical analysis of the soil and sand is required, and proper mix volumes must be determined.

**Texture**—Soils are typically made up of sand-, silt- and clay-sized particles in an almost infinite mix. Soil scientists have developed a classification of soils that assigns 12 texture classes, according to

*continued on page 26*



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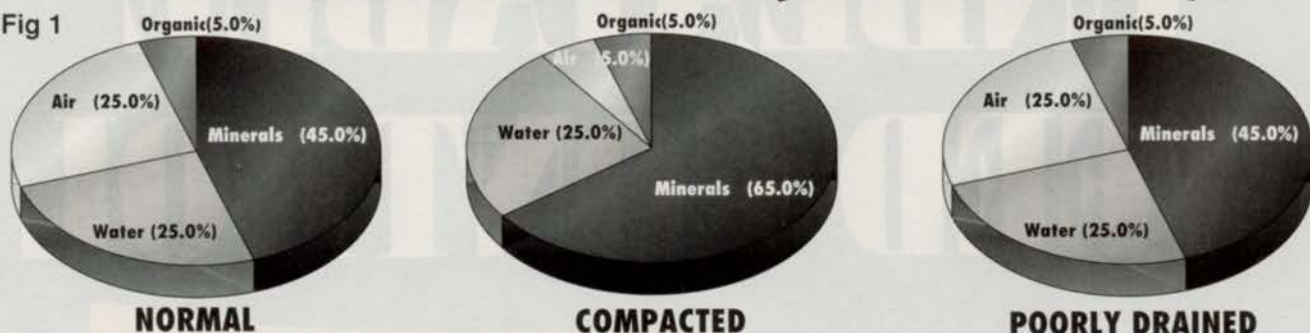
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# SOIL COMPOSITION (BY VOLUME)

Fig 1



## WALKER helps CLEAN CUT make their name



There's a place for "chop and drop" mowing at jet-like speed, but that wasn't what Dennis Dautel and Rex Gore had in mind when they started **Clean Cut Inc.** back in 1985. The Austin, Texas based company organized for high visibility landscape maintenance with a pursuit of excellence - and it shows with 16 environmental improvement awards in the past three years from national and regional landscape associations like ALCA, TALC, and PGMS. They wrote to tell us Walker is a part of all this:



\* We have been using your machines for the past four years and currently operate 12 machines. Your machines have given us a tool to produce quality turf in a fast, efficient and cost effective manner - Walker has given us a "clean cut" while keeping maintenance costs low. Please accept our appreciation for producing a quality product which, in turn, helps us produce beautiful landscapes.\*

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their range of particle sizes. The textural triangle is used in conjunction with a laboratory analysis to determine the texture class of a soil.

Many landscapers are often faced with specifications for soil textures that may not be present on site, and may be difficult to find. In constructing new landscapes, layering problems often occur when soils two or more texture classes away from each other are placed on top of another.

Because of the unique chemical and physical properties that sand, silt and clay impart to a soil, it is important to recognize the advantages and disadvantages of the soil texture classes and their impact on managing turf and ornamentals.

**Structure**—Organic matter also plays an important role in soil structure. Sands have no structure and occur as discreet particles. As the content of silt, clay and organic matter increases, individual particles stick together to form larger particles.

Silty and clayey soils will have improved drainage and aeration when well structured. Unfortunately, when silty and clayey soils are pulverized or compacted, they lose their structure. The addition of organic matter to silty or clayey soil will help form a well-structured soil over time.

Sand, silt and clay form the mineral particles that compose the major volume of a soil. An understanding of soil texture is important to avoid problems during construction of turf and landscape areas.



—The author is a consulting agronomist and general manager of CLC Labs, 325 Venture Dr., Westerville, OH 43081.



# LAWN CARE INDUSTRY

Serving the needs of the professional lawn care operator

## STATE OF THE INDUSTRY REPORT

# Chemical lawn care sales flat, but mowing, add-ons boom

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**1,000 surveys mailed, 221 returned; service 'mix' appears to be swinging slightly, toward add-ons; speculation that customer base eroded because of the economy.**

■ Sales of chemical lawn care services remained flat during 1993, according to LANDSCAPE MANAGEMENT's 1993 "State of the Lawn Care Industry" survey.

Sales of chemical lawn care services for 1992 and 1993 both totalled about \$1.7

billion, according to the last two annual surveys. However, the lawn care industry apparently experienced about a 4.2 percent growth from 1992—almost all in add-on services, including lawn mowing.

The 1993 survey shows that the indus-

try's mowing and allied revenues increased from a total of \$700 million to \$800 million in 1993. (Companies surveyed were those that define themselves as "lawn care service companies and custom chemical applicators" on BPA reader qualification cards.)

Revenues projected to the 7,175 such companies with subscriptions to LANDSCAPE MANAGEMENT magazine, then, amount to more than \$2.5 billion overall, compared to \$2.4 billion last year.

Because the survey indicates that more than half of the companies raised prices in 1993, industry experts speculate that, nationally, the industry's customer base actually eroded in 1993 because of the economy. This caused no net growth in chemical lawn care revenues.

Mowing and allied services, though, are apparently becoming more of a staple in the lawn care "mix." Last year, 27.0% of lawn care revenues were attained through mowing and allied services; this year, that number increased to 39.2%. Aeration services also grew, from 3.6% of the average customer "mix" to 5.2%.

Other statistics of note from the 1993 survey:

● The outlook is brighter for 1994: 74.2% of the sample projected growth this year, while 81.2% forecast growth in 1994. When asked specifically how much growth their business experienced in 1993, the average was 15.3%. Smaller companies were reporting growth of up to 300%. Moreover, the respondents are predicting an average growth of 18.0% next year.

● More than one-third (34.1%) of all respondents have not decided if they will increase prices in 1994. More will definitely increase prices (37.3%) than will

not (28.6%).

● The fastest-growing business cost is insurance, says 26.5% of the sample. Next is labor, named on 23.7% of the questionnaires, followed by equipment (21.0%) and compliance with government regulations (16.9%).

● Despite the shaky economy, lawn care company owners remain true to their visions. Almost one-third (31.4%) would not sell their business at any price, they say. Also:

—41.9% said they would not sell the business unless someone made them "an offer they couldn't refuse;"

—13.8% said they would sell the business "only for a profit;"

—10.5% said they would consider "any offer" to buy the business;

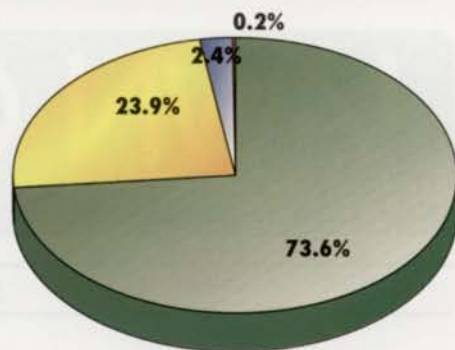
—2.4% said they are seriously considering folding the business.

● More than half (54.1%) thought that the Clinton administration's proposed new income and fuel taxes would have a moderate effect on business. An additional 24.8% thought the taxes' effects would be severe, while only 21.1% thought the effects would be "little or none."

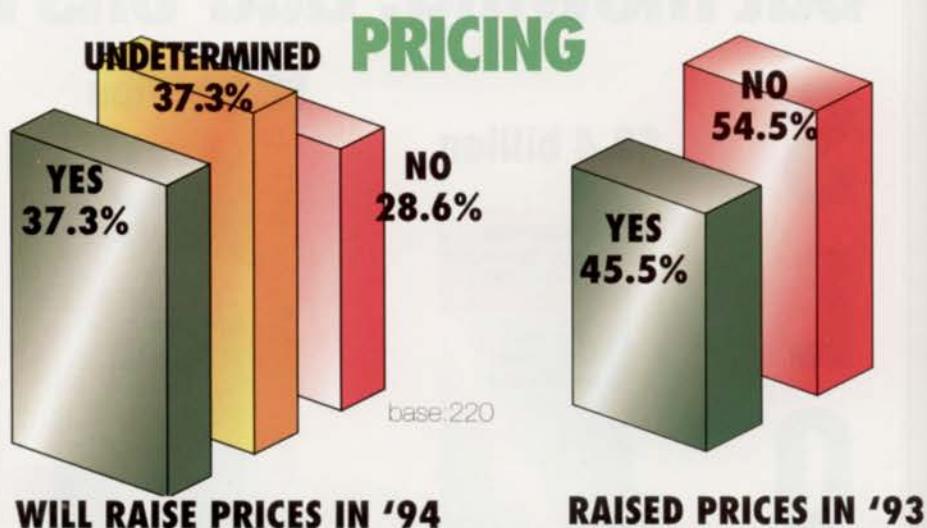
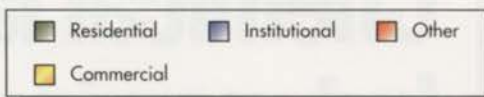
● Nearly one-third (32.1%) of the sample is less optimistic about the stability of the lawn care industry than before, while 20.6% are more optimistic. The remainder of the respondents have an unchanged opinion.

—Jerry Roche

## REVENUES FROM LAWN CARE ACCOUNTS, 1993



base:220



## REVENUES FROM LAWN CARE VS. MOWING ACCOUNTS, 1993





# RISING COSTS

**QUESTION: "Which business cost is growing fastest?"**

base:219



**LABOR**  
23.7%

**INSURANCE**  
26.5%



**EQUIPMENT**  
21.0%

**GOVERNMENT REGULATIONS**

16.9%



## 1993 Average Annual Expenditures

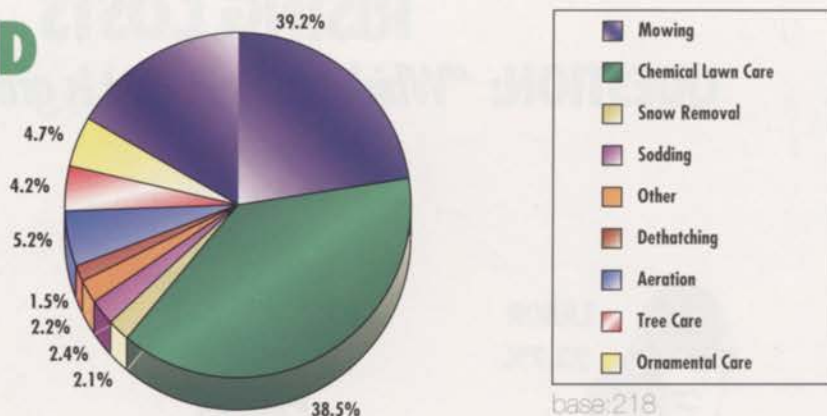
PRODUCT	% SURVEY BUYING	AVG. ANNUAL PURCHASE	PROJECTION TO LCO READERSHIP
Tractors	17.2	\$8,421.21	\$10,385,000
Domestic pick-up trucks	51.6	\$17,771.71	\$65,748,500
Dry fertilizer	84.9	\$15,183.43	\$92,486,500
Liquid fertilizer	34.9	\$17,276.12	\$43,255,500
Fertilizer (ornamentals)	43.2	\$2,777.11	\$8,613,500
Fertilizer/herbicides combinations	31.3	\$9,296.67	\$20,845,000
Pre-emergence herbicides	63.5	\$4,698.36	\$21,420,500
Post-emergence herbicides	62.5	\$4,954.17	\$23,269,000
Turf insecticides	58.3	\$6,172.32	\$27,058,000
Turf & ornamental fungicides	36.6	\$4,188.57	\$10,957,000
Turfseed	57.3	\$3,765.45	\$15,478,500
Sod	26.6	\$2,752.94	\$5,246,500
Sprinklers	21.4	\$11,968.29	\$18,337,500
Rotary mowers, > 36" cut	26.6	\$3,063.64	\$6,297,000
Rotary mowers, 36"-50" cut	21.4	\$6,046.34	\$9,264,000
Rotary mowers, < 50" cut	15.1	\$8,462.07	\$9,170,500

base:192



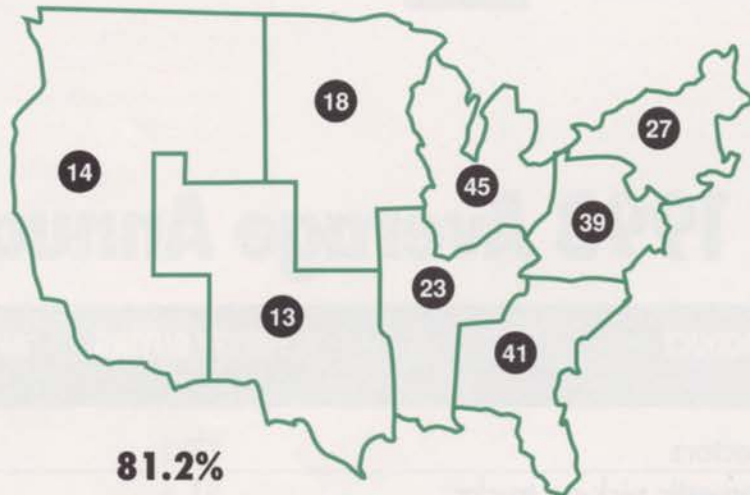
## SERVICES OFFERED

**QUESTION:** "About what percentage of your total business volume is..." (survey avg)



## GEOGRAPHICAL DISTRIBUTION OF RESPONDENTS

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SOUTHWEST =	TX, OK, NM, AS, CO UT	13
FAR WEST =	CA, NV, OR, WA, ID, MT, WY, AK, HI	14



## GROWTH TRENDS

