

The Cutting Edge on Reel Versus Rotary Mowers

by Nolan Meggers

There's no grass that is ideal for all athletic field applications and no one mower that's perfect for all mowing situations. Mower selections must ultimately deliver the desired cut quality at the desired turf height. No matter what great features the cutting unit offers, if it doesn't deliver a cut that consistently meets standards, the mower will be unacceptable.

Different grasses and different cultivars of the same grasses have varying tolerances to mowing. The blades of some grasses are easier to cut cleanly than the more fibrous blades of other grasses. Creeping, stolon-producing grasses, such as Bermudagrass, tolerate close mowing. However, more upright growing grasses, such as bluegrasses and ryegrasses, need higher mowing heights to thrive.

Another consideration is leaf texture. Fine-leafed grasses, such as certain Bermudagrasses and bentgrasses, can be mowed shorter than grasses having coarse leaf texture, like turf-type tall fescues. The height of cut should be determined by the natural growth pattern of the specific grass variety (physiological characteristics), the form and structure of the specific grass cultivar (morphological characteristics), and the role the grass has to play.

Whatever the turf cultivars, the "one-third rule" is recommended. This means cutting no more than one-third of the grass blade at any one mowing. For example, hybrid Bermudagrass may have a suggested height of cut ranging from 1/4 - 1 in. Therefore,

mowing should take place when the grass reaches a height of 3/8 in. for the 1/4 in. turf, and a height of 1-1/2 in. for the 1 in. turf. Kentucky bluegrass varieties with a suggested height of cut of 2 in. should be mowed when the grass reaches a 3 in. height.

Turf top growth helps insulate the growing points from temperature extremes. Excessively warm temperatures can drive a cool-season grass to dormancy. Temperatures that are too

positioned on the reel at an angle, and move across the stationary bedknife in a scissors-like action to produce a clean cut.

Rollers are positioned at the front and back of the cutting reel. Front rollers pass over the turf prior to mowing. These can be solid, grooved or spiraled. Optional roller scrapers can be used for cleaning the rear rollers to maintain a more consistent height of cut.

Reel mowers use individual cutting units that contain one reel per unit, and they can combine multiple cutting units to cover a wider expanse of turf. Generally, walk-behind reel mowers will have a single cutting unit, whereas ride-on reel mowers may have one or multiple cutting units. Many options are available in reel mowing units to meet individual needs while providing consistent cut quality.

A reel mower with properly sharpened blades gives a more precise, manicured-cut than a rotary mower. When the reel is powered at a consistent rate in the pre-set reel-to-bedknife position and the cutting unit is properly positioned for the ter-

rain, the mower produces a high-quality cut.

The cutting units should offer the option of being placed in fixed or floating position. The fixed position provides an even cut for flat turf conditions, while the floating position allows the mower to adjust to uneven terrain. The reel power source should be able to deliver consistent power under a variety of mowing conditions.

To attain the desired clean-cut precision, reel cutting units should be



A rotary mower clips Casey Field in Covington, VA.
Courtesy: Allen Dressler

cool will curtail the growth of warm-season grasses. Top growth also serves as a protective cushion against wear and traffic damage for grass growth points, which is always a factor on high-use athletic fields.

The Reel View

Reel mowers have fixed blades, which are part of a turning cylinder (reel) that moves down and back against a stationary bedknife at the base of the mower. The blades are



A walk-behind reel mower helps prune the field at Milwaukee County Stadium. Courtesy: David Mellor

easy to adjust in small increments of 1/16 - 1/8 inch within a range of mowing heights. On reel mowers, the cutting height is measured from a flat, solid surface to the edge of the bedknife. Reel mowers offer an option in the number of blades on the reel. Generally, the lower the desired height of cut, the greater the number of blades to the reel. For example, to maintain turf above 1 in., use five blades; for 1/2 - 1 in. turf, use six blades; and for turf maintained below 1/2 in., use seven or eight blades.

Reel mower cutting units may be quickly detached from the traction unit so that reels can be checked or ground, and adjustments can be made. Optional

backlapping valve attachments allow sharpening in place, right on the mower.

The Rotary View

A rotary mower has one or more horizontally moving, high speed blades that operate within the mower deck. The sharpened tips of the blades cut the grass by impact. On rotary mowers, the blades' function is not only to slice bits of grass with the two sharpened tips of the blade, but to create a vacuum within the mower deck. This pulls the grass up for an even, clean cut. Where material discharge is desired, the mower must generate sufficient clockwise blade rotation to move cut material to the discharge chute.

The addition of second and third blades within the mower deck allows the rotary mower to cut a wider swath. With a two-blade deck, the two blades must overlap. One blade is set further in from the drive wheel, while the other remains positioned with the drive wheel to facilitate discharge, as in a single blade mower deck.

In large-deck mowers with the three-blade configuration, the middle blade is set out to the front of the deck with the other two blades close to the right and left drive wheels. The closer the blades are to the drive wheels, the smoother the circle cut around a landscape feature will be. Each blade takes its series of bites. Horsepower



Reel mowers designed these eye-catching patterns at Milwaukee County Stadium. Courtesy: David Mellor

requirements increase as the bite size increases. Foliage removed by multiple-blade decks must move a greater distance to be discharged from the mower deck. This also requires additional horsepower.

On rotary mowers, engine speed controls the blade speed. The faster the mower moves forward, the larger the size of the bite taken. Lift can also vary with the type of blade used. Some blades have very little lift, while others provide a large amount and create a tremendous vacuum or pulling action. Some mower decks have the option of changing blades to fine-tune the cutting and vacuum. With mulching mowers, or mowers with the mulching option, the lift action of the blades and other mower features allow the blades to cut and re-cut the grass several times. The small sections of cut grass filter into the turf to decompose. With all these available options, model selections should meet turf care needs while providing consistent cut quality.

The rotary mower deck must follow the contour of the ground in order to put the blades in proper contact with the grass. With large-deck mowers, the wheel placement and the flexibility of motion should allow the deck to move or "float". Mowers must respond to the contour of the terrain by moving both vertically and from side to side. This avoids scalping grass and leaving uncut grass on one side of the mowing swath.


Correct set up and leveling of the rotary mower deck are extremely important for proper performance and

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good cut quality. With improper conditions, lift is reduced and too much of the blade comes in contact with the grass. Cutting height options should range from the lowest to the highest recommended heights for the grasses the mower will cut. The easier it is to adjust mower deck heights, the more frequently the adjustments will be made. On rotary mowers, the cutting height is measured from a flat, solid surface to the cutting edge of the blades.

In general, rotary mowers are better for higher cutting heights. They are more versatile, are better able to adapt to rough conditions, they can handle tough grasses, and they chop clippings for recycling. Further, rotary mowers are usually simpler mechanically and require less skill to operate and maintain than reel mowers.

Putting Mowers to Work on Sports Turf

Sports turf managers must match mowing frequency and height of cut to

the unique conditions of their fields. Variables include natural growth patterns of the grasses, weather conditions, the type of sports that will be played, the timing and intensity of use, and the type of mower used. On the highly maintained, irrigated fields of professional sports, seasonal changes may require only minor adjustments. Greater adjustments may be required on the practice and game fields of sports complexes, schools, and park systems when the turf is subjected to heavy wear in less than ideal conditions. Mowing decisions affect turf health, density, playability and grass variety dominance.

In southern regions, hybrid Bermudagrass may have a suggested height of cut ranging from 1/4 - 1 in., while common Bermudagrass can range from 1/2 - 1-1/2 in. In the northern transition zone, a Bermudagrass cutting height above 1/2 in. may produce a surface too loose and spongy for adequate footing. The cool-season grasses, bluegrass, perennial ryegrass

and turf-type tall fescue, have a suggested cutting range of 2 - 3 in.

For cool-season grasses, the ideal temperature ranges from 60 - 75F; for warm-season grasses the range is from 80 - 95F. When temperatures at grass growing points are above or below these ranges, growth slows or stops, and the turf goes into a period of dormancy.

Mowing is an important part of the art and science of sports turf management. Sports turf professionals must develop mowing strategies to fit their specific fields and conditions. □

Nolan Meggers is Product Manager, Market Development, Golf and Turf Equipment, Commercial Grounds Care Products for John Deere. He is based in Horicon, WI.



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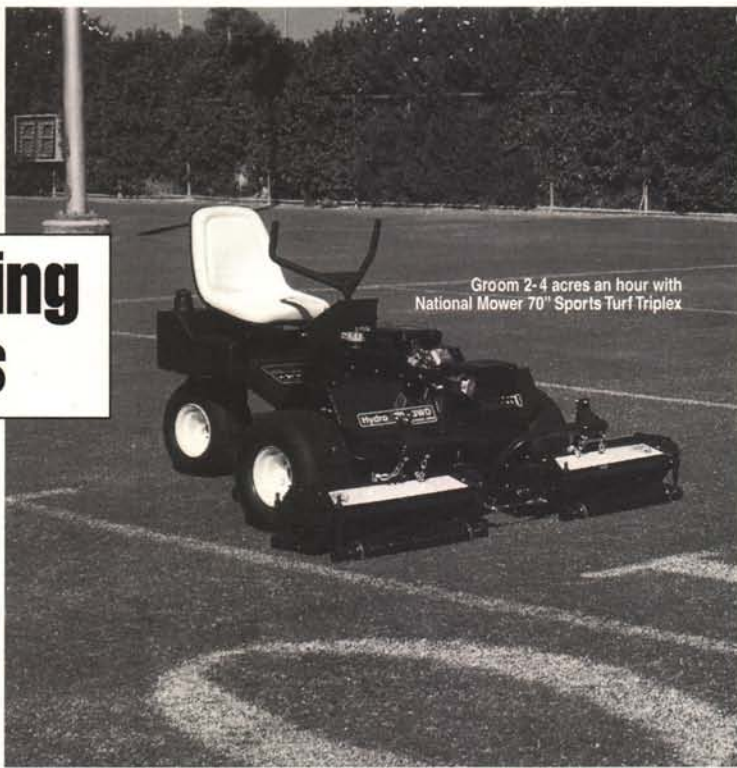
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Calendar for February 1998

February 16-20

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Professional Lawn Care Short Course, Holiday Inn on the Lane, Columbus, OH. Phone: (614) 292-4230. Fax: (614) 292-0492.

Conference, Hilo, HI. Contact: Jo Ann Johnston. Phone/fax: (808) 969-2088. E-mail: jaj@hilo.net.

February 17-18

The Ohio State University

February 17-19

The fourth annual Mid-Pacific Horticultural Trade Show &

February 18

The Connecticut Grounds Keepers Association's Trade Show and Educational Conference, The Hartford Civic Center, Hartford, CT. Contact: Donald Demichael, HINOKIOBT@aol.com.

February 19

Northeastern New York Nursery/Landscape Association Education Day & Trade Show, Marriott Hotel, Albany, NY. Contact: NENYN/LA, (518) 783-1322.

February 23-24

Turf and Grounds Exposition II, Holiday Inn, Suffern, NY. Contact: New York State Turfgrass Association, (800) 873-8873 or (518) 783-1229.

February 23-27

Long Island Turfgrass Management Short Course, Long Island, NY. Contact: Cornell University, (607) 255-1792.

February 24-25

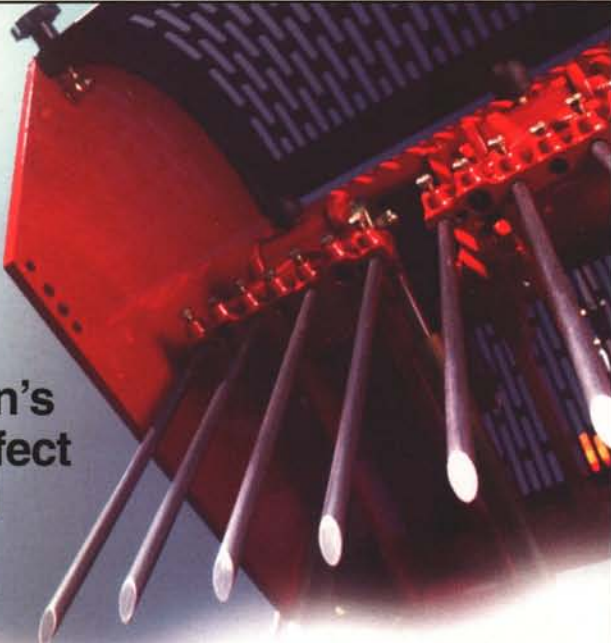
Advanced turfgrass management symposium: "Environmental Management and Communication on Golf Courses," Cook College, New Brunswick, NJ. Contact: Keith Wilson, (732) 932-9271. Fax: (732) 932-1187. E-mail: ocpe@aesop.rutgers.edu.

February 24-26

Western Pennsylvania Turf Conference & Trade Show, Monroeville, PA. Contact: Pennsylvania Turfgrass Council, (814) 863-3475. Fax: (814) 863-3475.

February 25-26

The 16th annual Southern Illinois Grounds Maintenance School Conference, Gateway Convention Center, Collinsville, IL. The program will feature two keynote speakers, plus 21 educational sessions covering woody ornamentals, arboriculture, landscaping, turf and herbaceous plants. A trade show also will take place. Contact: Ron Cornwell, (618) 692-9434.



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HAPPENINGS

Advanta Changes Name

Advanta Seeds West of Albany, OR., has changed its name to Advanta Seeds Pacific. Following the recent merger of the UK-based Zeneca Seeds and the Dutch-based Royal VanderHave Co., the new global seed company adopted the Advanta name.

"Changing the name of Advanta Seeds West to Advanta Seeds Pacific more accurately reflects our position as a member of the Advanta group and our approach to markets for our cool season grasses," says General Manager, David Holman. "We are based in the Pacific Northwest of the U.S.A. and are currently seeking to expand our export markets into other Pacific Rim countries."

The company's major cool season grass products include Kentucky bluegrass, tall fescue, perennial ryegrass and fine fescue.

Pioneer Launches Fields of Excellence Campaign

Pioneer Manufacturing is initiating a national "Fields of Excellence" search for outstanding athletic fields and their caretakers. Any institution that regularly maintains an outdoor athletic field may apply for award consideration. The campaign is designed to foster community and school spirit. A select number of exemplary fields will be awarded a certificate and banner, and a few schools randomly chosen from this pool will receive scholarships to commemorate the award.

Applications must be postmarked by March 31, 1998, and must include a completed application form, an essay and a non-returnable photograph. For information, contact: Pioneer Manufacturing Co., 4529 Industrial Parkway, Cleveland, OH 44135. (800) 877-1500; FAX (800) 877-1511.

Jacobsen Honors Distributors

During Jacobsen's recent International Business Conference at the Wigwam Resort near Phoenix, the company honored eight of its distributors by presenting them "Raving Fans Awards" for 1997. Jacobsen, a division of Textron, manufactures professional turf maintenance equipment used worldwide. The company gives the

awards annually to recognize superior service and customer satisfaction.

Distributors earning awards this year included: Brandt Industries, Regina, Saskatchewan, Canada; G.L. Cornell Company, Gaithersburg, MD; Delta States Turf, Inc., Baton Rouge, LA; B. Hayman Co. (Hawaii) Ltd.,

Waipahu, HI; Jacobsen Textron - Palm Desert branch, Palm Desert, CA; Malvese Mowers & Equipment, Inc., Hicksville, NY; PT Jayasakti Mardikaguna, Jakarta, Indonesia; and Wisconsin Turf Equipment Corp., Janesville, WI.

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University of Southern California Trojans
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San Francisco Giants
San Diego Padres
Los Angeles Dodgers
Oakland Raiders
Arizona Cardinals

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FRONT LINES

by Dave Ashman

Simpler is better. . .

A colleague of mine is experiencing some difficulties in getting his operation on track and keeping it on track. The same problems keep coming back, despite his best efforts to keep the program moving in the right direction. The situation reminds me of that old saying about not seeing the forest because of the trees. . .

Sometimes you have to color outside the lines. . .

My friend has one of the best turf management programs in his area. He has a definite vision of what wants. He has a good plan for the area and has written clearly defined policies and procedures to realize his goals. He has invested in state of the art equipment. He has adequate funds, a good crew and knowledgeable supervisors. He seems to have all of the tools for a cutting edge program in place. He even

called in a consultant to evaluate the situation to see if anything was missing.

After surveying the program, the consultant concluded that it lacked one key element that is crucial to success: training. My friend immediately dismissed the evaluation. How could training be the problem? He has one of the best computer programs for work order management, irrigation control, labor management, etc. He has an operations manual which outlines the protocols for all of the work performed by the staff. He has regular safety training meetings with the entire crew, and weekly staff meetings with the supervisors and management. There is an excellent exchange of information within the office. How could training be the problem?

The problem was in the organization's definition of training. Training is a never ending process. A good training program should include the following characteristics: a well defined plan of how to do things; a system for pre-

senting the information to the crew in a "classroom" setting; a system for demonstrating the protocols in the field; a system of benchmarks for measuring progress; and finally, a system for trainers to follow up in the field and in the classroom at regular intervals.

My friend's training program presented information to the crew in meetings, but there was no mechanism for following-up in the field. Another colleague gave him the example of the California Highway Patrol. Field supervisors stop CHP officers out on the road to quiz them on information presented in the morning briefing. My friend was finally willing to concede that his program could be improved. □

If you have a story or anecdote you would like to share, call (562) 425-2449, or write it down with your name and phone number and mail it to: Ashman & Associates, 3164 North Greenbrier Road, Long Beach, CA. 90808.

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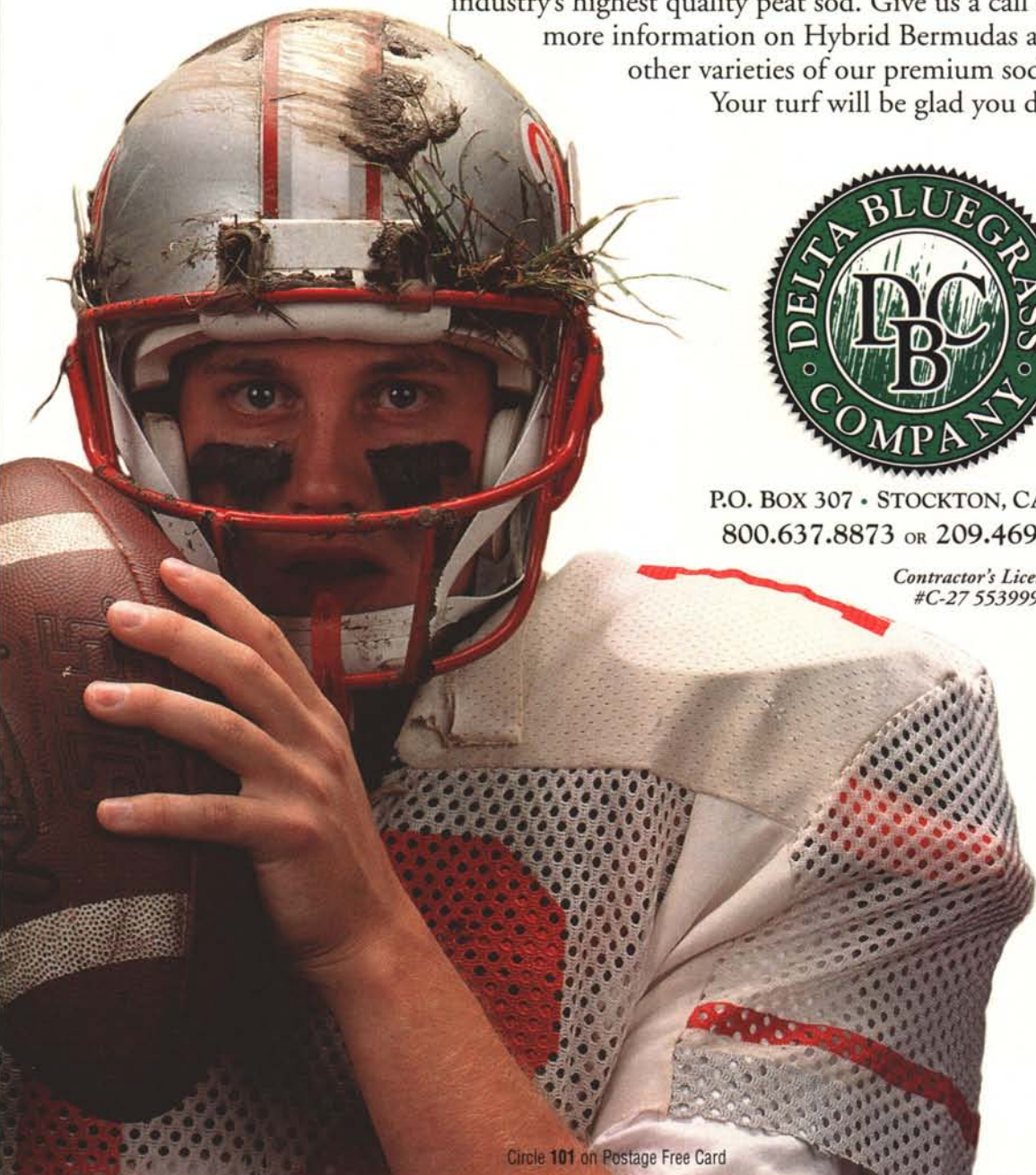
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Putting Tissue Tests to Work

by Dr. Henry Indyk

Athletic field turf is composed of a mass of complex organisms striving collectively and individually to grow and thrive in what all too often becomes a hostile environment. The job of the sports turf manager is to create and maintain conditions which support the positive elements of that environment, and to reduce or eliminate the negative elements. Tissue testing is a diagnostic tool which provides important data on the nutritional status of the turfgrass plant in its struggle for growth, health, vigor, persistence and survival. On the other hand, soil testing identifies key elements in grass plants' growing media by quantifying soil acidity, nutritional levels and the salt index.

Tissue testing quantifies the levels

of major and minor nutrients in the plant. Tissue testing doesn't replace soil testing, but works in conjunction with it. Tissue test results compared to soil test results reveal what is happening between the soil and the plant. When discrepancies occur between the results of the two tests, the sports turf manager must investigate the cause of those discrepancies.

It's important to know what is in the soil before an attempt is made to grow grass plants. Soil testing at this initial stage gives the sports turf manager data to work with in adjusting the levels of acidity, salts and nutrients to create conditions which match plant needs as closely as possible. Without this initial step, grass plants might not survive long enough to produce sufficient tissue for testing.

On established fields, annual soil testing done late in the growing season is generally sufficient to provide the necessary data. However, when difficulties arise in turfgrass growth, more frequent testing may be necessary.

Once the grass plants are growing, tissue testing is a good way to monitor what the plant is actually getting from the soil. Tissue testing is needed more frequently than soil testing, and should be done monthly throughout the turf's active growth period when turf is performing well. When poor turf performance occurs, despite adequate maintenance procedures, "normal" field use and "normal" weather conditions, additional tissue testing is beneficial.

For accurate test results, the procedures for taking samples and preparing them for delivery to the testing facility must be followed properly. Tissue testing should not be taken right after fertilization. For general tissue testing, random samples from the entire field are used. When problems occur in isolated spots, samples from the problem areas and controls from areas performing adequately should be taken separately and submitted for testing. Samples for tissue testing should be as fresh as possible when delivered to the testing facility.

Soil test results produce quantitative figures that can be compared to acceptable standards set for the particular kind of soil being tested. Tissue test results also produce quantitative figures, and they can be compared to the adequate range for each component of the testing. Each test has its own strengths and weaknesses. For example, tissue testing is the more reliable method for determining Nitrogen levels. For this reason, discrepancies may occur between the results of the two tests. In this case, the first step is to repeat testing to assure the veracity of those results.

A soil testing may confirm that acidity and salt levels are appropriate and nutritional levels are within the acceptable range, but tissue testing of

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