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STA Member Profile

STA Current President Gord Dol, Dol Turf Restoration Ltd.

1. You are the current president of the Sports Turf Association whose term is ending at the association's annual general meeting in February, 2008. What is your role in the turfgrass industry?
Andrea and I are the owners of Dol Turf Restoration Ltd. Dol Turf Restoration is a company that specializes in professional sports field and golf course work including artificial turf. We currently employ approximately 40 people in peak season.

2. What is the biggest challenge in your job?
Managing multiple projects with tight timelines, incorporating weather delays and other elements beyond our control.

3. What is the most satisfying part, what makes the job worthwhile for you?
Seeing the finished product. I feel a great deal of pride going back to a facility that we have constructed or restored and watching people, especially kids, playing and enjoying a safe field.

4. What is the biggest misconception about your job?
That owning a business is easy. You are constantly juggling work and home schedules. There never seems to be enough hours in the day.

5. What is your educational/employment background?
After finishing school, I worked for many years in a family sod business. At the time, Dol Brothers Sod was one of the largest sod operations in Ontario. In 1993, I left the family business and started Dol Turf Restoration Ltd.

6. Tell us about your family, your hobbies and favourite past times.
I am married and have four kids. Andrea (my spouse) works in the business managing accounting and human resources. Andrea is also the treasurer of our local hockey association. Matthew (21) is in the armed forces now stationed at CFB Petawawa. Patrick (15) and Eric (13) are actively involved in hockey and ball hockey. Patrick is also a referee in the hockey association. Colleen (12) participates in swimming, soccer and horseback riding. I am also involved in both the hockey and ball hockey associations as a coach, trainer as well as many other volunteer tasks in our community. I enjoy being active in local sports either coaching or as part of the coaching staff. In the summer I also play in local (beer league) baseball. During the winter months, I like to spend time on the trails snowmobiling.

7. How has the industry changed and in what direction(s) would you like to see the industry, as a whole, move towards?
Pesticides, over use of fields, and finding enough qualified people are a big challenge. More and more, we are losing the tools that we need to maintain safe sport fields.

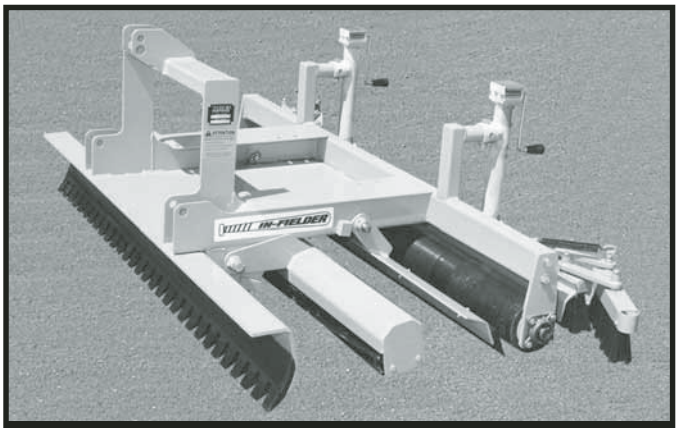
8. What do you consider to be the biggest benefit of being a member of the STA?
Networking! The Sports Turf Association is a well educated group of sports turf professionals who love their jobs. We are always trying out new products and procedures in maintaining our fields. The networking that happens during and outside our functions helps us all learn and be better sports turf managers.

9. What would your advice be for future presidents of the STA?
Go for it! I have found that being the president of this association and being part of the board to be very rewarding. At times it may seem like a daunting task with the many other pressures that life throws at us, but working with and meeting so many professional people makes it all worthwhile. ♦

QUOTABLE QUOTE

Leadership and learning are indispensable to each other.

~ John F. Kennedy, *1917-1963*
From speech prepared for delivery in Dallas the day of his assassination



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USING COMPOSTS TO IMPROVE TURF PERFORMANCE

PETER LANDSCHOOT • PROFESSOR OF TURFGRASS SCIENCE • PENN STATE

If you have been searching for ways to improve turf performance in marginal or poor soils, consider using compost as a soil amendment. In clay soils, good quality compost will improve structure, reduce surface crusting and compaction, promote drainage, and provide nutrients. In sandy soils, compost increases water and nutrient retention, supplies nutrients, and increases microbial activity. These improvements promote faster turf establishment, improved turf density and colour, increased root growth, and less need for fertilizer and irrigation. In many cases, compost production sites are located near areas of intensive turf use, providing a readily available and reasonably priced source of organic matter. Depending on your location, compost may be less expensive than topsoil and peat. When considering costs, keep in mind that compost usually produces better turf than equal or greater amounts of topsoil.

The following are some basic guidelines for evaluating the suitability of a compost for use on turf.

Appearance

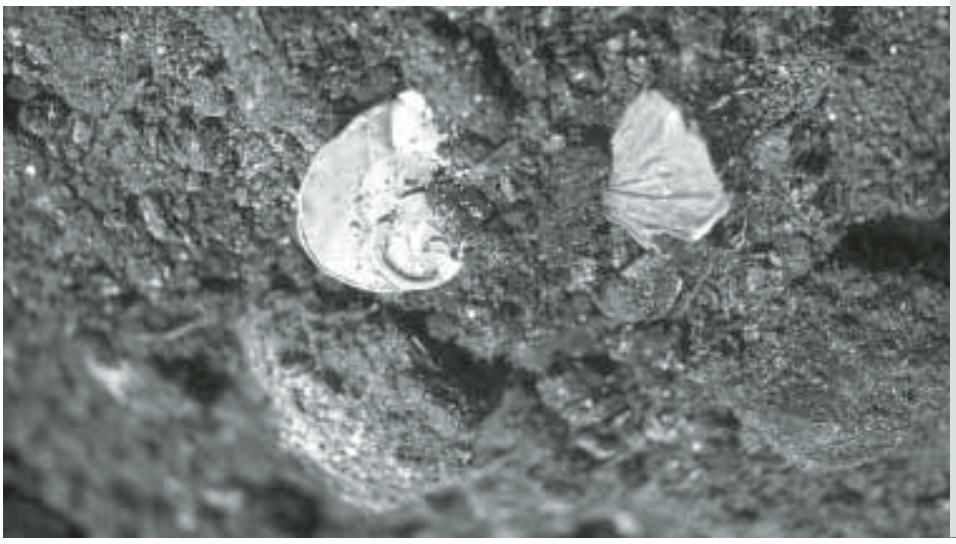
Although the appearance of compost will differ slightly among products, the colour should resemble a dark topsoil and have a light, crumbly structure. It should be free of large stones, large pieces of wood, trash (especially glass), and other objectionable objects.

Particle Size

The size of compost particles can vary depending on the method of application and how the turf is used. For use in surface applications on athletic fields or lawns, a compost should be able to pass through a 3/8-inch screen. Composts with slightly larger particles can be used as soil amendments if thoroughly tilled into the soil prior to seeding or sodding.

Odour

A good quality compost should have an "earthy" aroma (similar to that of a forest) and should not emit peculiar or offensive odours, such as those associated with ammonia or sulfur. These odours may be an indication that the compost is not mature (not fully composted). Immature



Some Selection Guidelines

Before selecting a compost, realize that not all products are alike. Composts are made from many different materials, including household refuse (municipal solid waste), leaves and grass clippings (yard trimmings), sewage sludge (biosolids), animal manure, paper mill by-products, and food residuals, to name a few.

Compost quality varies depending on the source and how it is produced. Because of differences in quality among composts, it is important to have some basis for determining suitability for use on turf. Ideally, the product in question has been field tested at a university and/or has been used successfully by other turf managers. Using a compost with a proven track record can take some of the guesswork out of the selection process, provided that the product is consistent from batch to batch.

Whether you are using a field tested product or one that has never been used on turf, obtain a sample of the compost prior to use and examine it for undesirable objects and peculiar or offensive odours. If the producer does not have an analysis of chemical and physical properties, submit a representative sample to a laboratory that will conduct appropriate tests and provide recommendations that you can understand.

Abjacent: Composts should be free of large stones, large pieces of wood, trash (especially glass) and other objectionable objects.

composts may have adverse effects on turf and should not be used.

Weed Seeds

If the product has been properly composted and stored, weed seed contamination will not be a problem. The composting process should destroy nearly all viable seeds. Occasionally, temperature control in some composting operations is not monitored adequately and some weed seeds survive. Another source of contamination is weeds growing on compost piles that have been stored outdoors for long periods. If these weeds are not controlled, they can deposit seeds in the compost. Although a few weed seeds do not necessarily preclude the use of a compost as a soil amendment for turf, composts containing large amounts of weed seeds are unacceptable. If possible, inspect the production site to make sure that weeds are not growing in or around the compost piles.

Moisture Content

The moisture content of a compost is important when uniform application and good mixing with soil is desired. Composts with moisture contents between 30-50% are usually ideal for handling, surface applications and soil incorporation. Wet composts (greater than 60% moisture content) tend to form clumps and do not spread evenly when applied to turf surfaces. Tilling wet material into soil may result in poor mixing and poor establishment. Wet composts also are heavy and difficult to handle. Dry composts (less than 20% moisture content) are easy to handle and spread easily, but may produce excessive dust. On windy days, this dust may leave a film on the windows or siding of nearby buildings. The dust also may be inhaled or may get into the eyes of the equipment operator. Dry composts that are high in organic matter tend to "float" on the soil surface during attempts to incorporate them. In this case, the equipment operator may have to spend more time and effort working the material into the soil.

Organic Matter & Ash Content

When using compost as an organic matter supplement, keep in mind that not all of the product is organic. In fact, some products contain less than 50% by weight of organic matter. Organic matter content can be determined by a lab test, but the most common procedure employed by laboratories considers everything that is combustible as organic matter (including wood chips, bark, leaves and plastic). Hence, a lab test may not tell you everything about the *quality* of the organic matter.

Although it is impossible to determine how much organic matter is present simply by looking at the product, a visual examination may tell you if the compost contains mostly decomposed, humus-like material or undecomposed organic matter, such as wood. Some test labs report a value called "ash content." Ash is the mineral matter that remains after the compost sample has been subjected to extremely high temperatures in a furnace. Assuming that everything burned off in the furnace is organic matter, the percentage of ash in the sample can be subtracted from 100 to provide an estimate of percent organic matter. For example, an ash content of 20% indicates that there is an estimated 80% organic matter in the sample. Keep in mind that this process only *estimates* organic matter. In reality it measures weight loss of any material that is combustible at high temperatures.

Using a compost with a proven track record can take some of the guesswork out of the selection process. Try to find a product that is consistent from batch to batch and preferably one that has been used successfully by other turf managers.

Carbon-to-Nitrogen Ratio

The amount of carbon (C) relative to the amount of nitrogen (N) in a compost is an important indicator of nitrogen availability. The carbon-to-nitrogen (C:N) ratio of a compost should equal or fall below 30:1. If it's above 30:1, soil microorganisms can immobilize nitrogen, making it unavailable to the turf. Fortunately, most commercial composts have C:N ratios below 30:1.

Nutrients

When compared with fertilizers, composts generally contain low amounts of nutrients. Whereas a small amount of quick-release nitrogen (ammonium) is present in some composts, most nitrogen is in the organic form and is slowly available to turf. Studies of biosolids composts show that only about 10% of the nitrogen is available to plants during the first growing season. Little is known about the nitrogen release characteristics of other

composts. Other nutrients, such as phosphorus, potassium, calcium and magnesium, can be present in significant quantities in composts. Some composts, however, may contain very low concentrations of one or more of these nutrients, and fertilizer supplements may be required to meet the turf's nutrient needs.

Typically, large amounts of compost must be applied to supply all or most of turf's nutrient requirements. This is difficult to achieve with surface applications since only a small amount of material can be applied in a single application. However, a 1- to 2-inch layer of compost tilled 4 to 6 inches into a soil can supply all of the nutrients necessary for turf growth and development for an entire year and possibly longer. The amounts of nutrients supplied by a compost depend on the source (animal manure composts are typically higher in plant nutrients than yard trimmings composts) and the availability of the nutrients. More research is needed to determine the availability of nutrients from different composts.

GUIDELINES FOR CHOOSING A COMPOST

Appearance, size and odour	
Colour	Brown to black
Size (surface applications)	1/4 to 3/8″
Size (incorporated)	1/4 to 1/2″
Odour	"Earthy"
Physical properties	
Moisture content	30 to 50%
Organic matter	Greater than 30%
Ash content	Less than 70%
Chemical properties	
Carbon:nitrogen ratio	Below or equal to 30:1
Nitrogen	0.5 to 3.0%
Phosphorus	Greater than 0.2%
Potassium	Greater than 0.2%
pH	6.0 to 8.0
Metals	Determined by government agencies
Soluble salts	Depends on turf species, type of salt, concentration and application method. Consult test lab or other expert to determine how this will affect the turf.

Note: Use this information only as a general guide. Some composts have properties that do not fall within these guidelines yet are acceptable in certain situations. Others, though they may fit these criteria, may have serious drawbacks.

pH

Most composts have a pH of between 6.0 and 8.0, a range favourable for turf root growth. A few composts, however, fall outside of this range. The pH of a compost may be detrimental to turf when very high (greater than 8.5) or very low (less than 5.5). Extremes in pH may result in reduced availability of some plant nutrients and/or toxicity problems. In a turf establishment study at Penn State, seedling inhibition occurred following incorporation of a 2-inch layer of poultry manure compost (pH of 9.1) into a clay loam soil. It is likely that the high pH and presence of ammonium in the compost caused ammonia toxicity and subsequent death of the seedlings. Fortunately, most soils are buffered against rapid and drastic changes in pH, and even composts with extremes in pH may not alter the overall soil pH a great deal. To be on the safe side, however, try using materials with a pH as near to neutral (7.0) as possible.

Metals

Composts made from biosolids often have higher metal concentrations than those made from other sources. Government agencies have established maximum levels of metals in biosolids composts that are to be used for land application. Composts used for turf usually have to meet the same standards set for other crops. There are several biosolids composts that have been used successfully on turf in Pennsylvania that fall below the maximum allowable metal concentrations for land application.

Soluble Salts

High concentrations of soluble salts may be present in certain types of compost, such as those made with spent mushroom substrates or animal manures. Excessive soluble salts can cause injury to turf by reducing water absorption, by toxicity or by a combination of both of these factors. A common question among turf managers concerning soluble salts is: at what salt concentration will turf injury occur? The answer is that it depends on the *type* of salt, the salt tolerance of the turf species or variety, and the method of application.

Most soil laboratories can analyze composts for salt content. However, the salt concentration by itself may be somewhat misleading since the *type* of salt may be more important in determining potential plant injury. For example, salts containing sodium are more toxic to turfgrasses than potassium salts. Turfgrass species and varieties vary in their tolerance to soluble salts. Salt-sensitive grasses such as Kentucky bluegrass may be injured at concentrations of about 3 mmhos/cm in the germination and seedling stage (turfgrasses are particularly vulnerable in the early stages of growth). A moderately salt-tolerant grass, such as tall fescue, may not

be injured unless the compost has a higher salt level (greater than 6 mmhos/cm).

The method of compost application may also influence the degree of salt injury. When composts are incorporated into soils, the salt concentrations are greatly diluted. Irrigation further diminishes salt concentrations by leaching them out of the root zone. In a recent establishment study

A 1- or 2-inch layer of compost tilled 4 to 6 inches into a soil can supply all the nutrients necessary for turf growth and development for an entire year.

at Penn State, a spent mushroom substrate compost with a soluble salt content of 8.10 mmhos/cm was incorporated into a clay loam soil and irrigated daily until Kentucky bluegrass seeds germinated (approximately 20 days). Despite this high salt concentration, no noticeable seedling inhibition occurred, presumably due to the dilution effect of soil incorporation and leaching. The salts were composed primarily of potassium and calcium, and the results might have been different if high levels of sodium were present. Surface applications of high-salt composts may cause injury to established grasses, especially during hot weather. Always irrigate to leach salts from the compost/soil mix immediately following surface applications to avoid the possibility of salt injury.

Summary of Guidelines

The preceding paragraphs serve only as a *general* guide. Some composts may meet these criteria but could have other properties that make them unsuitable for turf use. Others may have properties that do not fall within these guidelines, yet are acceptable for use in some situations. When choosing a compost as a soil amendment prior to seeding or for surface application, it is important that you are familiar with the product and how it will affect the turf. Try to find a product that is consistent from batch to batch – preferably one that has been thoroughly researched and/or used successfully by other turf managers. If you are unfamiliar with the product, be sure to examine it for colour, objectionable objects, particle sizes and odours. It may be worthwhile to visit the site where the compost is stored to make sure it is not contaminated with weeds or weed seeds. Other important considerations are moisture content, organic matter content, C:N ratio, nutrients, pH, metals and soluble salts.

METHODS OF APPLYING COMPOST

Soil Incorporation Prior to Turf Establishment

In most cases, composts are applied to the soil surface at a rate of between a 1-inch layer (approximately 3.1 cubic yards per 1,000 ft^2) and a 2- inch layer (about 6.2 cubic yards per 1,000 ft^2), then incorporated into the soil to a depth of 4 to 6 inches. In order to obtain maximum performance from your application, make

sure that the compost is mixed thoroughly with the soil and is not forming a layer at the soil surface. Depending on the product, this may require several passes with a rototiller.

The lower rate (1-inch layer) is better suited for marginally good soils and the higher rate (2-inch layer) for very sandy soils, clay soils, or subsoils low in organic matter. We have found that if more than two inches are applied, it may be difficult to mix the material 4 to 6 inches into the soil. On clay or compacted soils, it is helpful to rototill the soil first, then apply and incorporate the compost.

Modified spreaders with conveyor belts and brushes mounted on the back are ideal for surface applications of compost.

Although high nutrient-containing composts, such as biosolids composts or composted animal manures, can usually supply enough nutrients for good establishment, some composts (such as those made from yard trimmings or municipal solid wastes) may require additional phosphorus and potassium as well as starter fertilizer for vigorous seedling growth.

Although many composts can raise the pH of slightly acid soils, soils with a very low pH (below 5.5) may require additional lime. If you plan to use a compost with a high soluble salt concentration, make sure to thoroughly irrigate the site after incorporation and prior to seed germination in order to leach the salts.

Surface Applications on Established Turf

Composts are used frequently as surface applications (topdressings) on established turf. This practice provides a means of gradually incorporating organic matter into the soil without causing extensive disruption of the surface. The two most limiting factors associated with this practice are finding suitable application equipment and working the material into the soil. Since compost is light and bulky, a spreader with a large hopper is preferred. Modified manure spreaders with conveyor belts and brushes mounted on the back are ideal for spreading compost over large areas. Conventional tractor-mounted fertilizer spreaders have been used successfully but may require many refills. If spreaders are not available, compost can be applied to the surface by spreading piles into a thin layer with a York rake or a grading blade. For applications over small areas, the compost can be spread with a shovel and worked into the turf with a leaf rake.

When applying compost as a top-dressing, it is important to apply a thin layer (about 1/4 inch) and work it into the soil. Successive applications of thick layers without soil incorporation will result in a build-up of organic matter at the soil surface, which may cause rapid drying of turf roots and may form a layer that restricts root growth into the soil.

The best way to incorporate compost into the soil is through aeration. A good method is to apply the compost first, followed by several passes with an aerator equipped with hollow tines and a heavy drag mat attached. The drag mat will break up the cores and mix the compost with the soil, dragging some of the mix back into the holes. This operation is best performed during cool and moist seasons when grass is actively growing. Aeration and dragging can be stressful to turf during hot, dry weather. ♦

SUGGESTED AMOUNTS OF COMPOST

(in cubic yards) per unit area to apply to established turf as surface applications or to till into soil prior to establishment

	Inches of compost applied				
	Surface application		Tilled into soil		
Units in square feet	1/4	1/2	1	1-1/2	2
1,000	1*	2	3	5	6
5,000	4	8	15	23	31
10,000	8	15	31	46	62
20,000	15	31	62	93	123
30,000	23	43	93	139	185
40,000	31	62	123	185	247

*Amounts of compost in cubic yards rounded to the nearest whole numbers.

WINTERKILL OF TURFGRASS

DR. KEVIN W. FRANK • DEPARTMENT OF CROP AND SOIL SCIENCES • MICHIGAN STATE UNIVERSITY

"Winterkill" is a general term that is used to define turf loss during the winter. Winterkill can be caused by a combination of factors including crown hydration, desiccation, low temperatures, ice sheets and snow mold. Because of the unpredictability of environmental factors and differences in other factors such as surface drainage, the occurrence of winterkill on turf is variable and can vary greatly from location to location.

Crown Hydration

In general, annual bluegrass (*Poa annua*) is the most susceptible to crown hydration injury. During the warm days of late winter, annual bluegrass plants start to take up water (hydrate). Potential for injury exists when a day or two of warm daytime temperatures in late winter is followed by a rapid freeze. The most common time for winterkill associated with crown hydration and refreezing to occur is during the late winter and early spring when there is snowmelt or rainfall and then refreezing of the water that has not drained away. Crown hydration is a problem during these events because ice crystals can form in the crown of the plant, rupture the plant cells and ultimately cause the plant to die. Annual bluegrass is more susceptible to crown hydration injury than creeping bentgrass because it emerges from dormancy and begins taking up water. Creeping bentgrass remains dormant longer and, therefore, does not take up water and is not as susceptible to crown hydration injury during the late winter.

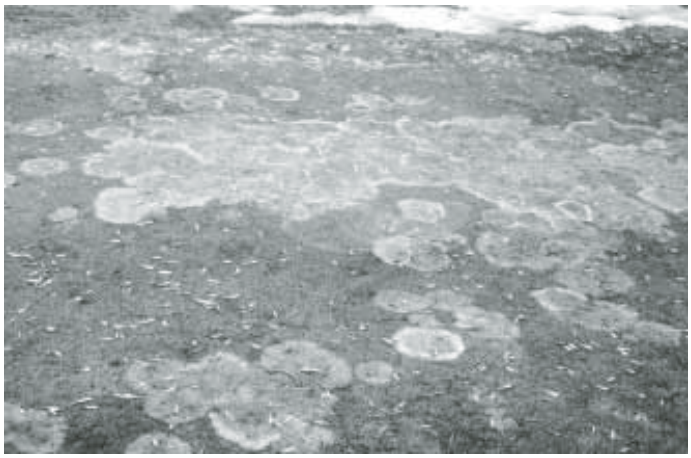
To assess if damage has occurred, samples can be taken from turf areas, moved inside and placed in a warm, sunny area to see if the turf greens up.

Desiccation

Winter desiccation is the death of leaves or plants by drying during winter when the plant is either dormant or semi-dormant. Desiccation injury is usually greatest on exposed or elevated sites and areas where surface runoff is great (Beard 1973). Winter desiccation injury to turfgrass in Michigan is normally rare, though sites similar to those described above can be prone to desiccation injury on a regular basis.

Low-temperature Kill

Low-temperature kill is caused by ice crystal formation at temperatures below 0º C (32º F). Factors that affect low-temperature kill include hardiness level, freezing rate, thawing rate, number of times frozen and post thawing treatment (Beard 1973). Soil temperature is more critical than air temperature for low-temperature kill because the crown of the plant is in the soil. It is difficult to provide absolute killing temperatures because of the numerous factors involved. Beard (1973) provided a general ranking of low-temperature hardiness for turfgrass species that were autumn-hardened.



Ice Sheets

Ice sheets are often blamed for killing turf when, in fact, it is crown hydration and subsequent refreezing that has resulted in the kill. The reason for the confusion is that as snow melts and refreezes creating ice sheets, the ice sheets are often in poorly drained areas where crown hydration can occur because of the standing water. As the ice sheet melts away, the area damaged closely mirrors where the ice occurred, and therefore, the conclusion is that ice sheets caused the kill. Beard conducted research on ice sheets on three turfgrass species: Kentucky bluegrass, creeping bentgrass and annual bluegrass. Kentucky bluegrass and creeping bentgrass survived 150 days of ice cover without significant injury; annual bluegrass was killed somewhere between 75 and 90 days of ice cover (Beard 1998). The author concluded that cause of death for the annual bluegrass was most likely from toxic gas accumulation under the ice sheet.

Snow Mold

The two diseases commonly called snow mold are *Typhula* blight (gray snow mold) and *Microdochium* patch (pink snow mold). Gray snow mold requires extended periods of snow cover; pink snow mold can occur either with or without snow cover. If snow mold injury is a recurring problem, preventive fungicide applications are the best control option.

Steps in Recovery

To assess if damage has occurred, samples can be taken from turf areas, moved inside and placed in a warm, sunny area to see if the turf greens up. If there is no green-up within a couple of weeks, the turf was killed. Reestablishing turfgrass in damaged areas can be very challenging

in the spring because of the cool, cloudy conditions that often persist. Depending on the extent of damage, either seeding or sodding may be necessary to facilitate recovery.

In areas where the turf was killed in a manner that left well-defined margins between dead and living turf, it may be feasible to strip dead turf and sod the area. In areas where the kill was more scattered, it may be easier to seed the area. Tools such as the Job-Saver aerator attachment, which produces numerous small, shallow holes, increase the success of an inter-seeding program. The interseeding process should continue weekly until the damaged area has recovered completely.

The interseeding process should continue weekly until the damaged area has recovered completely.

Keys to success for renovating winterkilled areas are to divert traffic from newly seeded areas, apply light fertilizer applications to stimulate growth, and irrigate to ensure that the seedbed or sod is moist throughout the establishment period.

— Michigan State Univ. Extension, Bulletin E-0019TURF, Oct. 2005, www.turf.msu.edu

GENERAL RANKINGS

of low-temperature hardiness for autumn-hardened turfgrasses

Low-temperature hardiness	Turfgrass species
Excellent	Rough bluegrass, Creeping bentgrass
Good	Kentucky bluegrass, Colonial bentgrass
Medium	Annual bluegrass, Tall fescue, Red fescue
Poor	Perennial ryegrass

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1) Beard, J.B. 1973. Turfgrass: Science and Culture. Englewood Cliffs, NJ: Prentice-Hall.
2) Beard, J.B. 1998. Winter ice cover problems? TURFAX. 9(1):1-2,5.

CONTRIBUTIONS WELCOME

Contact Lee Huether at the STA office if you are interested in contributing to the *Sports Turf Manager*. We appreciate feature-length articles, column ideas and newsworthy items. This is a great way to both support your professional association and enhance your resume!