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Member & Facility Profiles

CLIFF TOWERS, SUPERVISOR OF PARKS OPERATIONS, CITY OF MISSISSAUGA

Interview With Supervisor Cliff Towers

What kind of team do you work with? I work with an awesome Parks/Forestry Department that provides excellent customer service to both internal and external customers.

What are you and your team responsible for? Our team works in the City of Mississauga's North-East District. We look after all of the horticultural, sports turf, playgrounds and general park maintenance. Some of the high profile facilities under our care are the Hershey Sports Zone, Frank McKechnie Community Centre, Mississauga Valley Park and Dunton Athletic Fields.

Cliff Towers. Supervisor of Parks Operations
City of Mississauga, Ontario

What is the biggest challenge in your job? To continue to be proactive to engage the environmental challenges we will be faced with in the future.

What is the most satisfying part, what makes the job worthwhile for you? I love to empower staff to use their knowledge base/creativity to be innovative in the workplace. I also love working outdoors and interacting with staff and the public.

What is the biggest misconception about your job? That we provide a soft service to the community. The service we provide to the public is of vital importance. It gives individuals the chance to escape from the pressures they are faced with on a day-to-day basis. The service we provide enhances quality of life.

What is your educational/employment background? I am a Horticultural Landscaper Greenskeeper/Horticultural Nursery Greenhouse Worker, and have worked in the horticultural industry for the last 30 years.

Tell us about your family. I have a wonderful wife Barb to whom I have been married for 23 years. I have a daughter Amy (22), and a son Andrew (16), who are both amazing talented individuals.

If you are interested in being featured in this column, please contact Lee Huether at the STA office.

What do you enjoy doing outside of the workplace? We are a very musical family and have a studio in the basement of our house.

How has the industry changed and in what direction(s) would you like to see the industry, as a whole, move towards? I believe we have become a lot more conscious about workplace safety and think we should continue to look for opportunities to improve/practice due diligence.

What do you consider to be the biggest benefit of being a member of the STA? It is awesome to be able to collaborate in the industry and stay up to speed with any new developments.

HERSHEY SPORTS ZONE, MISSISSAUGA, ONTARIO

General information regarding the facility. Hershey Sports Zone North has two outdoor and one indoor artificial turf soccer fields, an indoor basketball facility, gymnastic facility, main bowl hockey facility, and four community hockey rinks. Hershey Sports Zone South has two outdoor artificial soccer fields, four community hockey rinks, one major cricket field, a skateboard facility, splash pad/playground, outdoor basketball court, naturalized park settings, and a leash-free dog run. The Hershey Sports Zone North & South comprise 136 acres in total.

Name, location of facility(s). Hershey Sports Zone North, located at 5500 Rose Cherry Way, and Hershey Sports Zone South, located at 705 Matheson Boulevard East.

How many employees are involved with turf care at this facility? Two full time staff and ten seasonal staff.

What is the primary type of turfgrass? Name of varieties. Perennial rye and Kentucky blue.

Is yearly overseeding part of your maintenance program? Yes. We overseed in the spring, summer and fall. **How many times do you fertilize?** Five times per year. **Do you aerate? Topdress?** Yes. We aerate five times per year and top-dress as needed.

Are community user groups involved or have they been involved in the construction/maintenance of this facility? In what manner? We have volunteer community groups that help pick up garbage and plant trees/shrubs.

How many hours per year are the fields permitted? Who permits them? Are the fields ever closed during the season to give them a rest? How much input do you have in the amount and timing of use? We permit our natural turf fields from May until September 30 and permit our outdoor artificial turf from March until November, weather permitting. We close our natural turf fields when we get inclement weather and can often move groups from natural turf facilities onto the artificial turf when we get rain. Local community groups permit our fields as well as other external customers.

Putting IPM Into Action Using Your Own Valuable Resources

Dr. Katerina Jordan, Department of Plant Agriculture, University of Guelph

FIELD DAY HIGHLIGHT

Continued from the cover.

Although IPM often uses pesticides as one of the tools for pest management, it is not a requirement, and the remainder of the techniques can be very effective at developing an effective management plan for most pests. The main fundamentals that are applicable to athletic field management include proper identification of pests and potential problems, proper monitoring and scouting, stress management for healthier turf, and a combination of the control options at your disposal.

Proper Pest & Symptom Identification

The first step in being able to prevent pest problems is to know which pests are a potential threat and being able to recognize both the pests themselves as well as the damage that they can cause. In addition, many symptoms are often caused by abiotic factors, including drought, fertility issues, heat and compaction. It is of equal importance that you are able to distinguish between symptoms caused by pest damage and those caused by an abiotic stressor. This means having a thorough understanding of insect life cycles, feeding habits, and the symptoms that they cause.

For weeds, remember that they are not really pests, as they do not harm the turfgrass plants. They are, however, indicators of poor growing conditions or stress that creates voids. Weeds are extremely competitive and are able to fill voids often more quickly than the turfgrass plants. Proper identification of weeds that are present in your fields will help with management and also with identifying conditions such as compaction, low fertility or excess moisture. Three of the more common weeds seen on athletic fields include plantain, clover and knotweed (pictured above) and all are indicative of low fertility, drought and compaction.

Insect damage becomes more difficult to identify and control as symptoms are somewhat non-descript and damage can occur rather quickly. However, proper identification of the various insects that are potential pests can help reduce symptom development through effective and well-timed cultural practices. The most common insect pests seen on athletic fields are usually white grubs (European chafer,

Top. Insect pests seen on turfgrass fields. **Left.** European chafer (Rhizotrogus majalis) **Right.** European cranefly larvae (Tipula paludosa). Photos courtesy of Pam Charbonneau.

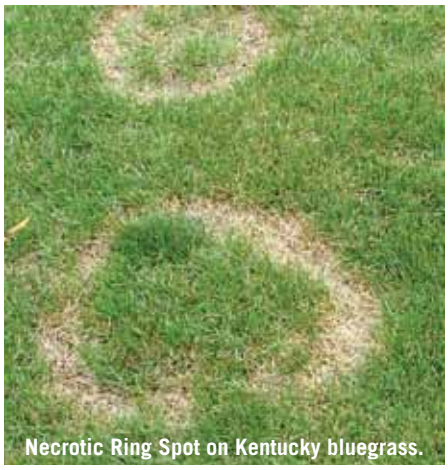
Above. Common weeds found on athletic field turf. **Left.** Broadleaf plantain (Plantago major). **Middle.** Clover (Trifolium repens). **Right.** Prostrate knotweed (Polygonum aviculare). Photo courtesy of Eric Lyons.

May/June beetle and Japanese beetle) and leatherjackets. Damage from white grubs is difficult to see before the turf is severely affected, so it is important to be on the lookout for any evidence of adult beetles or skunk feeding. For leatherjackets, symptoms should not be too extreme, but note excess activity of the adult European crane fly, especially toward the end of the summer, to give you an idea of whether or not they are likely to be present in your turf.

Diseases are fortunately not an issue on athletic fields, but the occasional necrotic ring spot (below) or rust can appear on stressed turf. The former is usually an indicator of excess thatch levels and low nitrogen while the presence of rust is usually evidence that fertility (especially nitrogen) is low and that there may be excess shade in the area.

Table 1: Common turfgrass weeds and the underlying conditions that their presence indicates. Adapted from Turf IPM Manual, OMAFRA, 2003.

Weed	Underlying Condition
Black medick (Medicago lupulina)	Low fertility, drought
Chickweed (Stellaria media)	Thin turf, excess moisture, shade
Clover (Trifolium repens)	Low N, drought, compaction
Crabgrass (Digitaria spp.)	Thin turf, low fertility, compaction
Moss (Various species)	Heavy shade, low fertility, low pH, compaction
Plantain (Plantago spp.)	Low fertility, drought, low HOC
Prostrate knotweed (Polygonum aviculare)	Compaction, low fertility, drought
Rough bluegrass (Poa trivialis)	High fertility, excess moisture, shade



Necrotic Ring Spot on Kentucky bluegrass.

Monitoring

The second fundamental that is of key importance in managing pests on athletic fields is proper monitoring or scouting. In order to reduce the effects of weeds, insects and diseases on managed turfgrasses, issues need to be assessed early on as this allows for the option of managing them through cultural practices. Monitoring involves carefully looking over your fields to make note of any changes in plant health or presence of weeds, insects, odd symptoms, etc. Some type of monitoring should be done each time that you are on a field and can be done by anyone who is working on a particular site. If you are at the managerial level, your best chance of success in recognizing issues early on is to train all of your employees to recognize different symptoms as well as early signs of pest presence. If you are one of the people who maintains the fields and sees them most often, make sure you keep an eye out for any changes in turf health, presence of new weeds or symptoms of insect damage or disease.

As important as monitoring for symptoms or signs of pests is, it is equally critical to keep accurate records of everything that you see. You should have a map of each field that is under your care and every time that you see something out of the ordinary make sure that you mark it down, by location on the field, so that there is a permanent record of it. This allows you to note any patterns of damage that may be chronic or that might hint at unfavourable environmental conditions or damaging usage patterns that could potentially be amended.

In addition, with enough data taken over time, you may find that you are able to predict when issues are going to occur and this can help you prevent problems in the first place. Another advantage of good record keeping is that it allows you to monitor the progress of symptom development, weed growth or insect populations over time. One of the best suggestions that I have heard on how to do this easily is with a map and various coloured highlighter pens with each colour representing a different issue. In addition to keeping track of turf symptoms or pest presence, you should also be noting weather conditions, if possible, specifically at your locations. Install a simple rain gauge to get an idea of the amount of water your fields have received and keep track of regional temperatures throughout the season. This will allow you to correlate any problems that you might encounter with weather conditions.

Finally, be sure that you keep good records of your management practices – mowing height and frequency, fertilizer rate and application dates, cultivation types and dates, overseeding (including species, rate and date), irrigation (if available) or any other practices performed for growth of the turf. When combined with the pest monitoring data, you might find that certain pests can act as indicators of unhealthy conditions. This is especially the case with weeds as they take advantage of voids or weakened, thin areas. As such, they are often indicators of issues that may exist with the soil or other growing conditions (see Table 1 above).

Stress Management

An often overlooked fundamental to remember as part of your pest management plan is stress management. In many cases, pests are present primarily because the desirable turf is under stress and thinned areas have become vulnerable to invasion from weeds or to symptom development from insects or diseases. The first line of defense against weeds and insect damage is not only keeping your turf at the appropriate height, but also mowing your fields

Above. Material collected as a result of vertical mowing. **Inset.** Cores from aeration done to improve soil compaction on an athletic field (photo courtesy of Eric Lyons).

frequently enough to ensure that you only remove 1/3 of the leaf blade at any cutting. You are better off mowing twice per week and keeping your turf a little bit higher to compete against weeds rather than mowing infrequently and cutting it down too short each time.

Fertility is also of extreme importance in reducing stress in your turfgrass plants. Adequate fertilizer levels in your plants allow for defense against weed invasion, rapid recovery from injury due to excess use, and growing out of insect damage. Timing and source of your fertilizer applications need to be appropriate as you want to avoid excess growth during times of heat and stress while allowing plants to recover from feeding or injury. Consider having regular soil tests performed as this information can tell you about the amount of phosphorus, potassium or other essential nutrients your turf might be lacking.

Cultivation is also a significant cultural practice that is key on athletic fields. With the amount of traffic that most fields see in a season, compaction is sure to occur in a short period of time. In addition to making the fields less safe for play, compaction also reduces the health of the turf by restricting root growth and subsequently not allowing the plants to access necessary water and nutrients. Core aerification should be done at least once per year and ideally both in the spring and fall on these high traffic areas. Also consider incorporating deep tine aerification periodically to break apart soil deeper in the rootzone. Keep an eye on thatch levels and use vertical mowing to remove excess thatch when needed. Thatch can lead to issues with water repellency (hydrophobicity), root restriction, soil compaction and reduced water retention. The final practice that is vital in maintaining healthy turf is irrigation. Although most of you likely do not have irrigation systems installed in any of your fields, this is something to consider saving for with any capital funds that you are given. One of the best defenses against weeds is properly timed irrigation and many insects can be managed through proper management of soil moisture.

Combination of Controls

The last fundamental to keep in mind is that of using a combination of control measures. In order for a pest management system to work over a long period of time, you need to take an integrated approach and utilize all methods at your disposal. This ensures that no one method is relied upon and gives you numerous options for dealing with pests. Cultural management has been discussed under the section of stress management and is the first defense against pest presence and damage. Remember to keep in mind that many pests are indicators of unhealthy turf and their presence is often a reminder that certain practices are possibly being overlooked.

Another method for dealing with pests is physical or mechanical removal. For insects, this may involve the use of pheromone traps (e.g. for Japanese beetle), but be sure to situate your traps away from your desirable turf as it is suggested that these traps actually attract insects to your site. Physical control with weeds could involve torching or hand pulling, a labour-intensive method that can be quite successful when weeds are still small.

A few biological control options are available for athletic field managers for both weed and insect control. The one thing that you need to be aware of with the use of biological control agents is that they require specific conditions in which to be effective, so the more you know and understand about how they work, the better chance you have for success with them.

Finally, there are some available chemical controls that are exempt from the provincial ban, primarily for use on weeds. As with any pesticide, be sure to read the label and follow instructions carefully to increase the efficacy and reduce any potential harmful effects on your turf.

In the End…

One of the most important points that I hope you take from this article is to remember that you truly are the best tool that you have. The more you educate yourself and understand what you are fighting in pest management, the more successful you will be in combating turfgrass pests without the use of conventional pesticides. Remember to get back to your basics – mowing, fertility, cultivation and if available, irrigation. Also, think about substituting the funds that used to be allocated for pesticides to grass seed as increasing the number of turfgrass plants is one of the best defenses you can have against most pests. Finally, remember to keep up with early monitoring and record keeping and do what you can to keep your turf as healthy as possible. With a bit more labour and some good practices, you should be able to maintain beautiful turf throughout the season.

Field Day Highlight: Managing Sand-Based Athletic Fields

John Sorochan, Ph.D., Department of Plant Sciences, University of Tennessee

Turfgrasses subjected to traffic are generally assessed by their ability to resist wear and recuperate. Because athletic fields receive an abundance of traffic, maintaining quality turf stands has always been a challenge. Root zone selection and developing sound management practices are two important components to maintaining quality athletic fields. Specifically, constructing a sand-based athletic field and properly implementing the primary cultural practices of irrigation, mowing, fertilization and cultivation will help maintain the most consistent turfgrass playing surface.

Generally, the root zone of an athletic field is either native soil or sand-based. Native soil root zones high in silt plus clay provide exceptional soil strength (soil stability); however, traffic from play often causes poor drainage and soil compaction to occur. In contrast, sand-based root zones provide smooth and uniform playing surfaces that resist compaction and have adequate drainage. However, sand-based root zones typically have low nutrient and water holding capacities. In addition, sands lack cohesion which can cause stability problems. Variables to control stability problems associated with sand-based root zones include: particle size distribution, average particle size, particle shape, soil density and soil amendments.

A well-graded root zone in which there is a significant distribution among sand particle sizes is preferred for sand-based athletic fields. Research by Dr. Jason Henderson (Asst. Professor, University of Connecticut) as a graduate student at Michigan State University determined that a sand-based root zone with 10% silt plus clay will provide both soil stability and adequate drainage for athletic fields. The sand content root zone near maximum density will retain macro pore space (air-filled pores) for rapid drainage, and the addition of about 10% silt plus clay will provide the soil stability and the increase in nutrient and water holding capacity. Unfortunately, the high costs and quality of available native soil to mix with the sand root zone can often limit blending the two.

STA FIELD DAY
Coverage from September 23, 2010.

Above. Sand channel after the drill and fill, Shields Watkins Field, Neyland Stadium, Knoxville, TN.

In contrast to athletic fields, the United States Golf Association specifications for putting green construction limit the amount of silt plus clay percentages (not more than 5 and 3%, respectively) that can be used in order to provide the desired infiltration (drainage) rates. In addition, very fine sand cannot be more than 5%, and the very fine sand and silt plus clay cannot be over 10% of the total root zone mix. Because the expectations for the use of an athletic field playing surface are extremely different than those for a putting green surface, it makes sense that Dr. Henderson's research recommends slightly higher percentages of silt plus clay. Higher silt plus clay percentages reduce soil infiltration rates, but provide firmer and more stable playing surfaces.

In addition to building a sand-based athletic field, properly implementing the primary cultural practices of irrigation, mowing, fertilization and cultivation will help maintain the most consistent turfgrass playing surface. Typically, sand-based athletic fields require more frequent irrigation compared to a native soil athletic field. This is because of the low water holding capacity.

Turfgrass water requirements vary depending on the time of year and weather conditions. Actively growing turfgrasses will generally require about 1 to 1.5 inches of water per week. The water used by a turfgrass plant is predominantly absorbed by the roots from the soil and can be supplied via natural rainfall events and supplemental irrigation. The amount of water that needs to be applied by supplemental irrigation will depend on how much water is available in the soil and how much the turfgrass demands. For example, irrigation applications will be more frequent during sunny days with high temperatures, low humidity and high winds than during cloudy days where humidity levels are high and temperatures are cool.

Thus, any factor that contributes to the turf transpiring more (using more water) and the soil losing moisture via evaporation would warrant increased irrigation scheduling. Therefore, it would not be accurate to suggest irrigation once, twice or three times per week because weather patterns change frequently. Instead, irrigation requirements should be monitored daily for turf watering needs.

Soil nutrient tests should be conducted regularly and subsequent fertilizer applications should be done for any nutrient deficiencies that occur. Nitrogen fertility for sand-based root zones should be more light (low N) and frequent if using water soluble nitrogen fertilizers because of the low nutrient holding capacity. Using slow release nitrogen fertilizers such as poly coated urea can reduce application frequencies and allow for increased nitrogen rates.

Mowing should be done regularly enough to not exceed the one third rule. This rule states that no more than one third of the leaf material should be removed at any mowing. Optimal mowing heights for cool-season athletic fields (Kentucky bluegrass and perennial ryegrass) are between 1 to 2.5 inches and 0.75 to 1.25 inches for warm-season athletic fields (bermudagrass and zoysiagrass). In addition, regular mower maintenance including reel or blade sharpening will assure the highest quality of cut.

Turfgrass vigor increases with the proper implementation of irrigation, fertility and mowing practices; therefore, as turfgrass vigor increases, irrigation, fertility and mowing requirements also increase. Sand-based athletic fields typically do not become compacted; however, layering problems as a result of organic matter accumulation often occur over time. Regular cultivation practices of aerification and topdressing are required to dilute organic matter accumulation and potential layering problems that build up. Whether it is Kentucky bluegrass for a cool-season athletic field or bermudagrass for a warm-season athletic field, organic matter accumulation as a result of decomposing roots, rhizomes and/or stolons, and clippings contribute to an increase in organic matter at or near the root zone surface that can over time impede infiltration rates.

This problem is especially pronounced on overseeded bermudagrass athletic fields in the transition zone and southern climates where turfgrass growth from both cool and warm-season turf occurs 10 to 12 months of the year. For example, Shields Watkins Field at Neyland Stadium in Knoxville, TN was constructed with a sand-based root zone that had 0.5% organic matter by weight. Over a ten year period, even with regular core aerification and sand topdressing, a 4 to 6% organic matter layer by weight formed in the top 5 inches of the 12 inch root zone.

For Bob Campbell, University of Tennessee Athletic Field Manager, the increase in organic matter was not high enough to significantly cause drainage problems, but infiltration rates decreased from the original rates. Because Shield Watkins Field is an overseeded athletic field, organic matter accumulation for the two turf species being used accumulates for ten months of the year. Compounding the problem is the fact that core aerification is only being done during the early summer and regular sand topdressing amounts and frequencies are limited due to the fall football season. Since the organic matter accumulation occurred over a 5" depth, conventional core aerification cannot penetrate deep enough to break up the layering profile, but coupled with sand topdressing the percent organic matter accumulation is diluted.

In order to address the layering issue, Campbell used deep tine drill and fill to create a series of channels backfilled with the original sand blend for water infiltration (see photo on adjacent page). The increase in organic matter was not necessarily a major problem, but it was an issue that needed to be dealt with in regards to water infiltration. Conversely, the increase in organic matter by weight over time has helped increase the nutrient holding and water holding capacities of the root zone.

With the ever increasing demand and use for athletic fields, the effects of wear as a result of traffic continue to be a challenge for maintaining quality sports fields. However, proper root zone selection and implementing sound management practices (irrigation, mowing, fertility and cultivation) will help provide more consistent, quality athletic fields.

Editors Note: Under Canadian conditions where bermudagrass is not grown, such a high buildup of thatch would not occur.