ASTM Standards for Skinned Areas

CONTINUED FROM FRONT COVER

Defining Ideal

A major problem in establishing recommendations for the construction and maintenance of skinned area soils is the broad range of fields. Baseball and softball diamonds vary from the true sandlot level where the basepath is exposed to native soil established by the players wearing away the turf as they run the bases to the premium fields of Major League Baseball.

Dr. Waddington says, "It's a long process to identify all the issues involved. With organized play, skinned area soils are part of native soil fields, augmented native soil fields and various construction formats of sand-based fields, all with differing levels of funding for construction and post-construction field maintenance. Even with the same basic construction and equal budgets, there are differences among teams and groundskeepers on what constitutes the 'right' degree of hardness and softness for the ideal skinned area.

"For construction, you could have something quite sandy that would have high moisture needs to maintain ideal playability or you could have something with a high clay content that would be quite stable, but might be too hard when dry. You need to know what kind of post-construction maintenance the field will receive in order to construct the right field for those maintenance conditions. The amount of play the field must support and the age and skill levels of the athletes are further considerations.

"I'd hate to see the day when there was only one way to construct and maintain a softball or baseball field. I don't think every Major League infield should be the same. They should all be reasonable and playable, but I think having the home field advantage brings another dimension to the game."

Guidelines, Not Practices

The need to set workable parameters among all these variables is the reason the ASTM Subcommittee on Natural Playing Surfaces is working on standard guidelines for skinned area soils. Waddington says, "*It's important to note that, in this instance, we're working on guidelines, not practices*. An ASTM practice gives a definitive procedure for performing one or more operations. Guidelines give a series of options or instructions that do not recommend a specific course of action. With either guidelines or practices, people have the choice to follow them or not to follow them. ASTM doesn't legislate."

The guidelines for skinned area soils under development by the subcommittee should give a range of construction options for the three different types of fields: native soil, sand and modified soil. Within the range of options would be construction formats relying heavily on internal drainage and those relying primarily on surface drainage. Also, within those separate ranges, there should be room to accommodate the differences in tools, soil amendments, equipment, personnel and overall funds for maintenance at varying levels of field use. The goal is a set of practical guidelines that can be applied to real world situations under real world practices.

Guideline Status

According to Waddington, the ASTM Subcommittee on Natural Playing Surfaces has nearly finalized the draft proposal that was used to solicit comments and help. A task force composed of ASTM subcommittee members sought input from others who are involved in the sports field industry, but are not ASTM members. Dr. Waddington also sent the draft proposal to many university personnel for their input.

Dr. Waddington notes, "We've asked these individuals to make comments, express their objections, if any, and provide information to support any objections. Keeping to the spirit of ASTM, if you don't like something, you suggest something that is better.

"Something that goes to a vote of the subcommittee and receives no negative votes then goes to the full committee for a vote. (The full committee and the ASTM Society votes are taken on the same ballot.) All this must follow the ASTM established timetables."

The ASTM Committee on Sports Equipment and Facilities officially meets twice a year, in May and November. Much is accomplished in the intervals between the official meetings as the committee members incorporate decisions and suggestions into their specific projects. Proposals developed pass through a range of voting, from task force, to subcommittee, to committee and the total membership of the Society. Changes may be incorporated at each step of this process.

The guidelines will be submitted to the subcommittee for vote at the next cycle and the votes, comments and any objections will be received in the summer of 2000. Should this round of votes achieve the anticipated positive response, the guidelines could go to the main committee and Society levels for vote after the November 2000 meeting. ♦

— Steve and Suz Trusty are partners in Trusty & Associates of Council Bluffs, Iowa. Steve is Executive Director of the Sports Turf Managers Association. Article reprinted with permission from sportsTURF, Volume 16, Number 2, February, 2000.

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328 Victoria Road South, Guelph, ON N1H 6H8
Tel: (519) 763-9431, Fax: (519) 766-1704
E-mail: sta@gti.uoguelph.ca
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EDITOR
Michael Bladon

PUBLISHER
New Paradigm Communications
R.R. #8, Owen Sound, ON N4K 5W4
Tel. (519) 371-6818, Fax: (519) 371-5789
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STA OFFICE HOURS
Lee Huether is in the office from 9:00 a.m. to 2:00 p.m. Tuesday, Wednesday and Friday. The office phone number is (519) 763-9431. At other times, a message may be left on the voice mail system. Please include the vital information of name, telephone number with area code, and time of calling. The office may be reached at any time by faxing (519) 766-1704 or via e-mail.

Turf News Briefs: New STA Hours

United Kingdom

A leading figure in the UK turf industry, Dr. Michael Canaway, Chief Executive of the Sports Turf Research Institute (STRI), has decided to take early retirement. Michael visited Canada at least once to deliver talks at the Ontario Turfgrass Symposium and visited the Guelph Turfgrass Institute while here. Dr. Canaway has given 25 years of service to the STRI, the last five as Chief Executive. During his tenure as Chief Executive, the STRI has undergone a significant program of modernization and expansion. We, the Board of Directors of the Sports Turf Association, wish Michael a healthy and meaningful retirement.

CGSA President Elected

At the 51st Canadian International Turfgrass Conference and Trade Show in Ottawa, Merlin Affleck was elected the Canadian Golf Superintendents Association President for 2000. Mr. Affleck is superintendent of the Stanhope Golf and Country Club in Prince Edward Island.

STA New Office Hours

Effective immediately, Lee Huether's office hours will be Tuesday, Wednesday and Friday from 9:00 a.m. to 2:00 p.m. The office is no longer open on Mondays.

PLEASE NOTE

The opinions expressed in articles published in *Sports Turf Manager* are those of the author and not necessarily those of the Sports Turf Association, unless otherwise indicated.

DEADLINE: JULY 14, 2000
Content for September issue.

The President's Desk

JANE ARNETT-RIVERS

Time is certainly moving by quickly. My last message was written during a snowstorm! Currently I am wondering how many hours in the day we need to keep up with the rate at which the grass is growing. Certainly if you are in southern Ontario, there is no need to explain. We must keep reminding ourselves not to complain, as I have not seen vegetation looking this lush in Oakville's parks in recent years. Surely the long days on the mowers will shorten soon enough.

The Sports Turf Association Board of Directors has been very busy developing a Strategic Plan for the coming years. One of our main initiatives is to educate all levels of staff with information and resources promoting safe, natural sports turf. We spent a day with a facilitator mapping out ways of doing this – one is to continue with this publication at its current high standard – the other is to continue presenting our annual field day.

Speaking of which, plans for the 13th Annual Field Day are almost set. The event will be held on Wednesday, August 16, 2000. This year we will focus on baseball. Spending the day will be Ed Miller, retired groundskeeper for Yankee Stadium. I have attended a lecture of Mr. Miller's before and found it both informative and very entertaining. His tips are applicable regardless of the facilities you maintain and you will find yourself retelling his stories of life in the "big leagues."

Other topics for the day include soil testing with David Smith, and Gerry Ray and Oliver Bremer will discuss the new Barrie Community Sports Complex. We will spend the afternoon outside watching suppliers work their magic with turf, infields, and mounds. There will be an abundance of expertise, experience and advice on site. Space is still available for suppliers wishing a tabletop and/or equipment display.

The day promises outstanding exposure for suppliers as attendance increases every year. Registration forms will be out shortly. Sign up soon as last year's event was a sell-out. Members' cost for the day includes refreshments, lunch and parking.

Invoices are out for membership fees for the current year. If you have not renewed, please do so. Thanks to industry support, beginning this year we will be printing the roster in its entirety on an annual basis, rather than biannually with an annual insert.

Congratulations to Karen Richter of Waterloo and Robert Gill of Prince Albert, Saskatchewan. Both are recipients of the Sports Turf Association Scholarship. Karen, for the Year 2000 Turf Managers' Short Course and Robert, for the Ontario Diploma in Horticulture. We look forward to congratulating you both at our Field Day in August. We hope you will be able to attend.

Thank you to all who ticked the STA box when registering for the January Ontario Turfgrass Symposium. Sports turf member attendance was up substantially. The OTS Committee is currently working on the speaker roster for 2001.

Finally, in the craziness of the past three weeks where we bounced back and forth from hot sunny days to cold rainy days, I was placing hurried phone calls to industry suppliers recruiting support for our Field Day.

Interrupting their day at such a busy time, I fully expected to be asked to call back in June. That was not the response from anyone. All the companies I approached were more than happy to take the time to listen, and then responded quickly. It made me realize the importance of the Sports Turf Association in this industry and the respected role we play in promoting safer, natural sports turf. Thank you very much for all the support. The Field Day will be a success largely due to our industry suppliers. ♦

Welcome STA New Members

Paul Lynch
SportGrass™ Specialist
Dol Turf Restoration Ltd.
Thornton, ON

Ross Tucker
Manager of Parks
City of St. Thomas, ON

Robin Bennett
Facilities Manager
Glenlyon-Norfolk School
Victoria, BC

Scott McCann
Engineered Turf Soils &
Materials Limited
Kitchener, ON

Bob Golden
Vice President, Commercial/
Irrigation, Turf Care Products
Canada Ltd., Newmarket, ON

Wray Mason
Turf Care Agronomics
Turf Care Products Canada
Ltd., Newmarket, ON

Gary Taylor
Irrigation Golf Manager, Turf
Care Products Canada Ltd.
Newmarket, ON

Rob Davis
Commercial Sales
Representative, Turf Care
Products Canada Ltd.
Newmarket, ON

Gillian Glazer
Manager, Century Rain Aid
Thornhill, ON

Phil Bruckler
General Manager
Community Services
City of Stoney Creek, ON

Barry Gurski
Physical Resources, Grounds
Conestoga College
Kitchener, ON

René Laurin
Facilities Manager
Town of Penetanguishene, ON

Ken McGuirk
Leader of Forestry,
Horticulture & Outdoor
Facilities, City of Kingston, ON

David Schroeder
Parks Supervisor
City of North Bay, ON

Blake Downey
Organizational Leader
Parks Maintenance
City of Waterloo, ON

Darrell Vossen
Parks Supervisor
Central Services & Waterfront
City of Toronto, ON

Jeff Danylyk
Community Services Depart.
City of Kitchener, ON

Helen Sousa
Parks Supervisor
Parks & Recreation
Services, West District
City of Toronto, ON

Steve Preston
Supervisor of Parks
Maintenance & Operations
City of Brampton, ON

Jay Kivell
Manager of Facilities &
Parks Services
City of Guelph, ON

Scott Ingram
Leadhand, Sports &
Winter Maintenance
City of Guelph, ON

Chris Hare
Halton Grounds Care
Equipment, Milton, ON

Gerry Ray
Executive Director
Barrie Community Sports
Complex, Barrie, ON ♦

SPORTS STA TURF ASSOCIATION

Turf Maintenance for Thoroughbred Horse Racing

A EUROPEAN OVERVIEW BY HUBERT CATRICE, CONSULTANT, BAILLY, FRANCE

American thoroughbred tracks train and race on all-weather dirt. Turf is often built in the inner part of the dirt oval, with little radius on the curves and strong banking, and is used for few races when the climate is favourable to the grass growth. In Europe, racing takes place on large turf courses, and training is on both turf and sand.

Assessment of American dirt – fast, good, slow, muddy, sticky, sloppy – cannot be related with terms such as hard, firm, soft, holding, and heaviness of turf. Comparisons in the scale of track speed are based on professional feeling and measurements with penetrometers or accelerometers.

The following overview of turf maintenance for thoroughbred horse racing details turf specificity, tries to define the qualities required and which basic parameters to integrate, and concludes with a discussion of future industry trends.

Specificity for Thoroughbreds

The objective of turf maintenance is to get maximum horse speed without injury or medication. This relates to the ability of the turf to resist the impact of hooves and the ability of the horses to resist a lack of turf flexibility.

Horse racing turf is a living form in constant change and is composed of:

1. Soil with physical, mineral, chemical and microbiological components,
2. Plants with stems, leaves, roots, and a layer of decomposing organic matter called thatch,
3. Water and air.

Since the main criteria for turf in the racing industry is speed, it is important that the hoof should find a point of resistance near the top of the racing surface able to support forces which are continually changing in intensity and direction. Furthermore, the influence of climatic conditions should cause the state of this surface to vary in such a way that the horse can demonstrate both its ability and muscular and skeletal solidity, which is necessary for breeding selection.

To understand the specificity of turf maintenance, we observe the contact between hoof and turf at the linear speed of the horse (between 60 to 70 km/h), that is to say a higher speed for the hoof.

During a race, a horse places all its weight alternatively on each leg. This represents a considerable energy output according to mass and speed. At the time of hoof impact, a sharp deceleration is produced and the shock is absorbed by a rapid deformations mechanism in the structure of the hoof, and then by muscular contractions, while turf divoting appears. The absorption phase of the impact ends according to the position of the fetlock held by the tendons tensed according to the resistance of the turf. The propulsion phase follows. All these phases result in the track being marked or damaged and rapidly repaired.

Turf Qualities

The local conditions and horsemens' wishes, along with the turf superintendent's knowledge, are combined to try to define physical and biological turf specifications such as:

1. Flexibility to soften the impact in conjunction with the hooves and to facilitate the movements of the joints and their coordination in the rocking movement of the foot.
2. Elasticity, resilience, and bounce to propel the horse without causing damage to its limbs.
3. Homogeneity so that the forces of resistance can be produced in a constant way and supply a standard point of resistance over the whole course.
4. A cushion to soften the impact and a sub-layer to respond in varying degrees to support and propel the limbs. A need to realize a compromise between the mechanical qualities of flexibility and the resilience of the turf.

The vocabulary uses concepts coming from turf experience but also from dirt tracks and is of a great variability. Authors such as Dr. J. B. Beard and Dr. Bob Sheard have started the introduction of scientific concepts to properly define the quality of turf.

Turf Parameters

The complexity of turf maintenance consists of integrating the external factors – climate, racing calendar, type of races – with plant and soil factors while taking into account qualities of the turf at the period of racing.

An optimum combination of the following parameters allows the superintendent to establish a turfcourse maintenance specifications and schedule.

Soil texture and structure

Shock absorption is realized by friction of fine mineral particles – sands (or materials with organic or of large granulars) – roots, shavings, and elasticity. A soil rich in organic elements absorbs shock by reversible deformations and is more elastic. The top layer must have crumbly characteristics over a depth which can be up to 7 cm. Beyond this, tendons and ligaments may be overtaxed.

Thatch and rootzone

The need on the horses' part is to benefit from the best conditions of shock absorption by the top layer and resistance from the sub-layer. A thatch level considered good for the horses is undesirable for the turfgrass.

The formation of this thatch is caused by several factors and maintenance operations: the choice of grass species and cultivars, height and type of mowing, collection of clippings, use of fertilizers, microbiological life, overseeding, climate and racing calendar, movable rails, repair after the races, intensity of rolling, in-depth irrigation, aeration and subsoiling.

Moisture and porosity

The optimal soil moisture control allows the axis of the horse limbs to remain in a plane perpendicular to the impact in any direction. This characteristic dictates turfgrass to be the best racing surface avoiding injuries and inflammatory problems.

Optimal soil moisture content maintains cohesion which produces elasticity – an intermediate state between viscosity caused by too much water which results in slippage, movement of the earth without compression, and plasticity in which reduction of porosity produces compression and compaction.

Knowing the drainage speed, potential evapotranspiration, rain forecast, and flexibility expected, the irrigation decision of "how much" and "when" balance between conflicting requirements – what is needed for the plant and maintaining watering just enough to provide the turf flexibility required for horse racing speed.

Future Trends

On racecourses without intensive use, traditional operations of turf maintenance require an important seasonal team of personnel, without heavy investment except in large turfgrass areas. This model can provide a good level of safety for centuries.

The general evolution of the racetrack industry is to expect an increasing return on investments. This is more conducive to projects and investment programs on "all weather" turfs allowing a more intensive use on small surfaces with standardization of the "track speed," and a reduced team of personnel using larger scale equipment and materials. Therefore, private companies develop systems for reinforced rootzone and soil moisture control to give permeability and sufficient air filled pore space.

Systems, registered trademarks, or special turf maintenance processes are realized using sand and synthetic fibres. Keeneland and Churchill Downs in Kentucky with subirrigation; Santa Anita in California; Hong Kong in Asia with Netlon; and Australia and Singapore with StrathAyr Turf Systems are good examples of such patented and public systems.

Horse racing authorities contract with organizations to develop research, trials, and consultancy, as the Ontario Jockey Club with the Guelph Turfgrass Institute for the construction of the new Woodbine turf track; the Jockey Club of Britain with the Sports Turf Research Institute of Bingley for the Nottingham racecourse; the Japan Racing Association with its Facilities Research Engineering Division; The University of Arizona Race Track Industry Program with the Racing Surfaces Association Symposium; and the New Zealand Racing Industry Board with the New Zealand Research Institute. This list is not exhaustive.

Also, the International Turfgrass Society, with its International Research Conference every four years, publishes in its proceedings the important research work of universities, organizations and many other companies around the world.

We must keep smiling! Those who continue to look for better, safer turf for horse racing still have a lot of work to do in this area: trials, research, cooperation, consultancy, education, engineering programs, turf maintenance, project management, information and communication. ♦

— Author Hubert Catrice is a Consultant for Turf for Horse Racing and member of the Sports Turf Association. You can find Hubert at www.agroconsultants.com or e-mail him directly, Hubert.Catrice@wanadoo.fr.

Environmental Benefits from Artificial Turf? ... Definately!

GORDON PEDERSON, SUPERVISOR, SPORT AND OUTDOOR RECREATION, BURNABY PARKS, BC

Artificial turf ... isn't that the abrasion-causing, joint-tearing, scrub-pad looking fake grass?

Artificial turf products have improved vastly over the past few years so forget any of the memories or nightmares you may have experienced on traditional artificial turf fields.

The City of Burnaby just completed constructing a multi-million dollar, state-of-the-art sports complex consisting of three artificial turf sport fields. The Burnaby Lake Sports Complex West is now the home of a revolutionary artificial turf product, which is also the first outdoor installation of its kind in Canada.

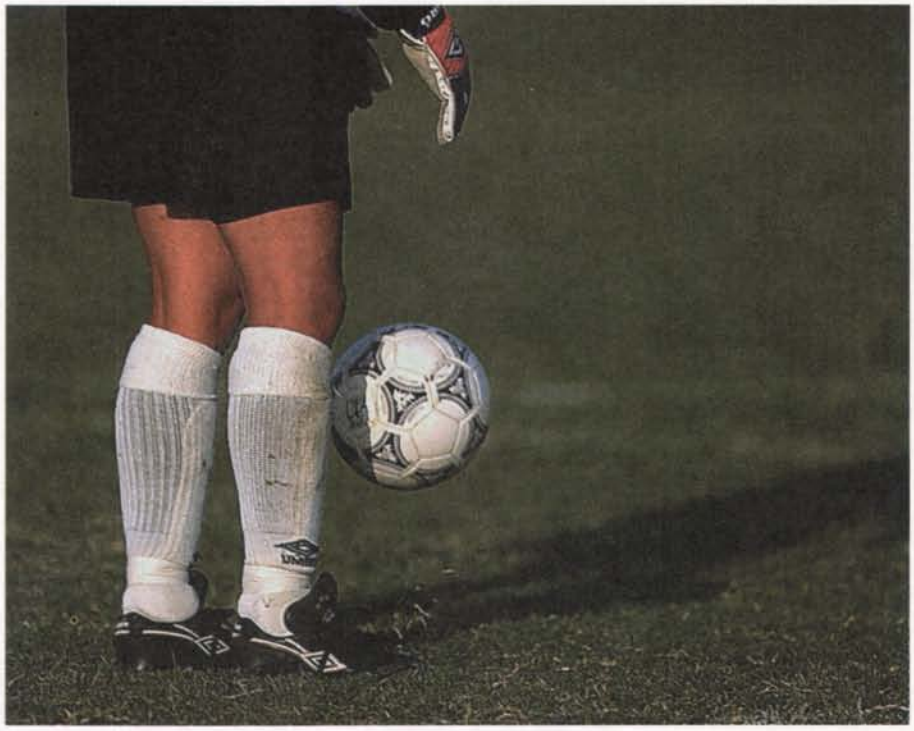
Without getting too technical, the product chosen by the City of Burnaby was an "in-fill" turf system rather than the widely used traditional "carpet" turf systems. Instead of a "carpet" laid over a hard surface, an in-fill system is comprised of 2-1/2" artificial grass blades tufted into a rubber backing with a combination of silica sand and ground rubber spread amongst the blades to a 2" depth.

The polyethylene and polypropylene blended grass blades give the turf the look of real grass, and the in-fill material gives it the playing characteristics of real grass. Although soccer is the primary beneficiary of the facility, the multipurpose fields also accommodate football, field lacrosse and field hockey.

All the user groups are astounded at how well the product performs and the vast majority prefer the "in-fill" artificial turf to natural grass. A by-product of the in-fill system is that turf abrasions and knee and other joint injuries commonly attributed to traditional artificial surfaces are greatly reduced.

Why Artificial Turf?

Why choose an artificial turf field over a natural grass surface? The Greater Vancouver and Victoria regions are unique to the rest of Canada. The relatively mild winters encourage soccer organizations to play their primary soccer season from September through March. Unfortunately, these West Coast regions also live up to their nickname the "Wet Coast."



During the fall/winter soccer season, natural grass playing fields face severe rainstorms leading to surface damage and often field closures. On the other hand, artificial turf fields can be played on in nearly all weather conditions without any impact to the field surface. Rainstorms are no longer a problem since the Burnaby Lake Sports Complex West fields are designed to drain 10" of rain an hour, which even for BC is more than accommodating!

Durability

One of the most appealing features of artificial turf is its durability. A standard natural grass sports field can accommodate approximately 360 games per year while a lit artificial turf field has the capability of accommodating approximately 2,080 games per year during prime time hours. This works out to an approximate 6:1 ratio. In addition, the artificial turf sports field provides a consistent quality-playing surface that the user groups can count on from week to week. Heavy wearing sports can be relocated to the artificial turf protecting the existing natural grass fields for the other user groups.

Efficiency

Due to its durability, artificial turf utilizes the land far more efficiently than natural grass fields. Had the City of Burnaby chosen not to build three artificial turf fields, nearly 18 new natural grass fields would have been required to provide the same level of activity.

As a neighbouring suburb of Vancouver, Burnaby has some of the most expensive land in the country. High acquisition costs and a limited supply of undeveloped park land has become a determining factor for the use of artificial turf in Burnaby both now and in the future.

Cost Per Game

Decision-makers often can't get beyond the capital cost requirements for constructing an artificial turf field – approximately $1 to $1.4 million compared to a natural grass field of $350,000. But when the capital and operating costs of both are compared to actual usage over a 12-year life span, calculations show that artificial turf per game costs are approximately 65 per cent cheaper than natural grass.

Maintenance Requirements

As expected, maintenance requirements for artificial turf and natural grass differ quite dramatically. No matter what anyone says, artificial turf fields are not maintenance free though maintenance expenses are approximately 50 per cent lower than natural grass fields.

No Chemical Applications

Unlike natural grass fields, artificial turf does not require fertilizer or other chemical applications eliminating any concerns of leaching into surrounding ground water or streams.

Water Conservation

In-fill artificial turf systems do not require irrigation thus eliminating the need for additional water consumption. For regions serviced by water meters, the savings can be significant.

Recycling

The in-fill turf system chosen by the City of Burnaby also incorporates recycling into its construction process. Almost 30 per cent of the ground rubber particles that make up the in-fill material are generated from recycled running shoes.

Re-use of Existing Land

Artificial turf fields can also create an indirect environmental benefit. Burnaby's new complex is adjacent to an existing sports complex with nine natural grass sports fields. To improve the quality and performance of these natural grass fields, the site will be renovated over the next few years. The performance capabilities of the neighbouring artificial turf fields now provide an opportunity to redesign the older site. With a lot of the sports usage demand transferred to the artificial turf field site, not as many natural grass fields are required. Staff is currently working on redesign plans that will revert a portion of the field space neighbouring Burnaby Lake back to a wetland environment.

Summary

At first, it sounds absurd to think that replacing natural grass fields with artificial turf would have environmental benefits for the community. But beyond its performance capabilities, artificial turf has shown it can provide an efficient way of maximizing limited land resources. In addition, the in-fill turf system has demonstrated environmentally friendly maintenance practices by eliminating fertilizer and irrigation requirements. After all is said and done, the artificial turf may be considered "fake" but the recreational and environmental benefits certainly aren't. ♦

— Parks & Recreation Canada, Volume 57, Number 6, January/February 2000

Gordon Pederson, Supervisor of Sport and Outdoor Recreation, Burnaby Parks, Recreation and Cultural Services, researched artificial turf fields for three years leading up to the project's construction. He can be contacted at: Burnaby Parks, Recreation and Cultural Services, Suite 101, 4946 Canada Way, Burnaby BC V5G 4H7, Tel: (604) 294-7385 E-mail: pederson@city.burnaby.bc.ca.

Turf for Cricket. A New Challenge for Ontario.

CANADA HOST COUNTRY FOR 2001 WORLD CRICKET COMPETITION: REPORT BY DR. LES EVANS

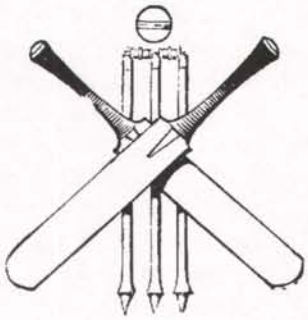
Probably in no other sport is the turf surface so critical to the tactics and playing of the game as it is in cricket. Unlike baseball, the cricket ball generally bounces on the soil surface a few feet in front of the batsman before being struck. This means that the playing surface must be able to withstand a continuous bombardment of balls striking the surface at speeds of more than 100 km per hour during the course of a one-day game.

The quicker the ball leaves the surface and the more even the bounce, the better the pitch. If the surface is too soft, then the ball will not rise sufficiently for the batsman, whereas if the surface is too hard, the playing area not only becomes dangerous but the surface will deteriorate rapidly during the game. A soil with a clay loam or silty clay loam texture containing between 25 to 35 per cent clay is ideal.

Game Preparation

In an established pitch, getting the right texture can be obtained by top dressing with a suitable heavy loam if the texture is too light or hollow tining with a light soil if the soil is too heavy. Getting the right soil texture is only a small part in the preparation of the perfect cricket wicket. The wicket is the playing area for the game and is approximately 10 by 66 feet.

Work usually starts in spring by scarifying the surface to remove debris and cutting the grass to 3/8 of an inch. The application of a heavy roller (13 to 15 cwt) over the pitch consolidates the soil to a depth of 3 to 4 inches, provided there is sufficient moisture in the soil. Any earthworms present need to be eliminated. Between games, the grass is usually kept at a height of about 1/2 inch. Any weeds present are generally spot killed.



There is little to no expertise in Ontario for the construction and maintenance of grass cricket wickets.

About six to ten days before a game, the grass is cut to 1/8 inch and scarified to thin out the grass. Three to four inches of water are added and the soil is then rolled with a heavy roller. Large covers are placed over the wicket in the evenings to keep the wicket dry. This routine is followed up to three days before a game when watering is discontinued.

By match day, very little grass will be visible on the wicket. How the wicket stands up during the game now depends on the thoroughness of the pre-game preparation with grass roots playing a major role in holding the soil together. At the end of the game comes the challenge! Having removed almost all of the above ground vegetation and compacted the soil through heavy rolling, the pitch must be ready again for a new game within a few days or weeks. Established grass must be revived and dead grass replaced. The soil needs to be top dressed with seed and soil, aerated, and fertilized to encourage new growth. Then the whole process of pitch preparation starts again in readiness for the next match.

At the end of the season in the fall, the pitch must be repaired, seeded and prepared for winter so that the next spring a minimum amount of reseeding needs to be done. The soil needs to be thoroughly scarified and spiked to prevent the formation of thatch – a major problem in ill prepared pitches. The pitch is finally overseeded with rye grass, top dressed with loam, fertilized, and the soil well watered to allow the seed to germinate before the start of winter.

Cricket in Canada

Historically, Canada has not been known for its involvement in hosting world class cricket competitions. This all changed in 1996 when a major cricket tournament, the Sahara Cup, was played at the Toronto Cricket, Skating and Curling Club. Five one day matches between India and Pakistan were played. The live television viewing audience for one game was estimated at 1.5 billion people! Because of the success of this series, Canada bid for and was chosen to be the host country for the 2001 ICC World Cricket Competition. This competition will involve 26 countries, including the US,