A...st 1988 Volume 1 Issue 4

SPORTS TURF NEWSLETTER

PRESIDENT'S MESSAGE

We hear about the problems the lack of rain is causing in agriculture in southern Ontario, but Sports Turf is affected as well. Kitchener and Cambridge have both closed their soccer fields and as of this writing are considering extending the ban to baseball. This is a serious situation not only because of the number of people who use the facilities are affected, but also the stress on the grass plant from the drought. The roots of the grass plant tend to shrink with the high soil and air temperatures. Use of the field by groups or mowing dangers the crowns. Annual Bluegrass will not appear until seed germination in September. Kentucky Bluegrass rhizona are also very sensitive to drought. Nobody really knows what to expect because this is a record year for lack of rainfall.

On a more positive note your Board will be having an all day "think tank" strategy session in August to see how we are doing and discuss our future plans.

Since our article in Civic Public Works Magazine we have picked up several interested people from the Western and Maritime provinces so not only are we becoming better known, our membership is swelling.

South of the border exciting news is that Sports Turf Managers Association now has joined with Sports Turf Magazine as the official publication for their Association. So things are moving in the Sports Field Area.

Lastly, my thanks to all those Board Members who organized and helped to make the June 16 Field Day such a success. I had many very nice comments on the way it was arranged and the quality of speakers.

Yours for better, safer Sports Turf,

Michael J. Bladon (President)

INSIDE THIS ISSUE

WELCOME!

To Our New Members

Ted Hartwell
Hartwell Irrigation Specialists
Rexdale
Ron Barnes
Supervisor
The Board of Education for The City of London
City of Etobicoke
Parks and Recreation
Rothwell Seeds Limited
Lindsay
H. Verschoren
City of Brampton
Parks and Recreation Dept.
Liane McKenna
City of Scarborough
Parks and Recreation Dept.
Mr. Dan Gutteridge
Parks and Recreation Department
Sarnia
Les Andrew
Property Manager
Ridley College
Andrew McFall
Lakehead University
St. John's Municipal Council
City of St. John's
The Corporation of the City of Hamilton
Parks Division
Peter Taylor
Operations Manager
Ottawa Board of Education
Rusty Warkman
Supervisor Athletics Fields and Turf
City of Toronto
Ken McNally
The Corporation of the Town of Newmarket
Fred K. Bockel
Parks Maintenance Manager
Town of Markham
City of Kitchener
Parks and Recreation Dept.
Holland Equipment Ltd.
Norwich
Fairlawn Sod
Lynden

GUIDELINES FOR SPORT-FIELD MAINTENANCE
WORK PLAN FOR: FIELD HOCKEY

by: Ron Dubyk

ITEM	A	M	J	J	A	S	O	N	COMMENTS
Spring Cleanup	X	X							– cleanup of winter debris – layout lines of play (use a transit)
Goal Posts	X	X					X	X	– installed prior to May 15 – remove after October 15 – repaint/repair during the winter
Goal Nets		X	X	X	X	X	X		– check daily – repair/replace as required
Field Use		X	X	X	X	X	X		– by permit only May 15 - October 15 – play suspended due to inclement weather; determined by staff!
Litter	X	X	X	X	X	X	X		– inspected daily for rocks, glass & other debris
Benches/Bleachers		X	X	X	X	X	X		– inspect daily, repair as necessary – repainted in the off season
Weedspraying	X	X					X		– use of 2-4D (Killex) as per recommended rates. Signs posted.
Insects/Disease			X	X	X	X			– as diagnosed
Irrigation		X	X	X	X	X	X		– energize system & make necessary repairs by May. – winterize system in October – maintain equivalent of 1" of rainfall
Mowing		X	X	X	X	X	X		– mowing height of 1¼" – cut an average of 5 times every 2 weeks
Line Stripping		X	X	X	X	X	X		– lines applied every week using white latex paint plus water (1 : 1 ratio)
Aerating/Slicing		X	X	X	X	X	X		– use of aerator, break up and redistribute cores (2 directions) if applicable
Soil Testing							X		– end of season
Sod Repairs							X		– at end of season, usually goal mouth and centre field areas
Signage		X	X	X	X	X	X		– prepare in the off season – secure in visible and vandal-proof area – inspect daily, when in use
Fencing		X	X	X	X	X	X		– maintain/repair as necessary
Lighting		X	X	X	X	X	X		– inspect DAILY — replace/repair as required
Topdressing		X	X	X	X	X	X		– drag mat in two directions – mixture depends on existing field soil, drainage, use, etc. – recommend higher sand proportions
Overseeding		X				X	X		– watch fertilizer ratio, use 15-30-15 @ 12k gN/ha (0.25 lbs./1000 sq. ft.) in each direction, when overseeding – use turf-type perennial ryegrass – spring seeding is recommended
Fertilizing	X	X	X	X	X	X			– based on annual soil samples – apply 25-5-10 @ 12k gN/ha (0.25 lbs.N/1000 sq. ft.) in each direction. At least ½ the nitrogen should be in slow release form. – see "Overseeding" for fertilizer rates during the overseeding operation
Documentation	X	X	X	X	X	X	X	X	– ongoing, daily recording of all of the above noted items!

SPORTS FIELD DAY REPORT

The newly formed Sports Turf Association proudly held and sponsored its second annual Field Day at Etobicoke's Centennial Park on Thursday, June 16, 1988. With one hundred and twenty five participants the programme covered such topics as emergency planning for special events, field drainage requirements and highlighted a panel discussion on maintenance of sports turf with fellow members of our association as participants.

Our special thanks go to Ken Mrock of the Chicago Bears organization and to Dr. Kent Kurtz, Executive Director, The Sports Turf Managers Association in the United States for sharing their expertise and experience with our members.

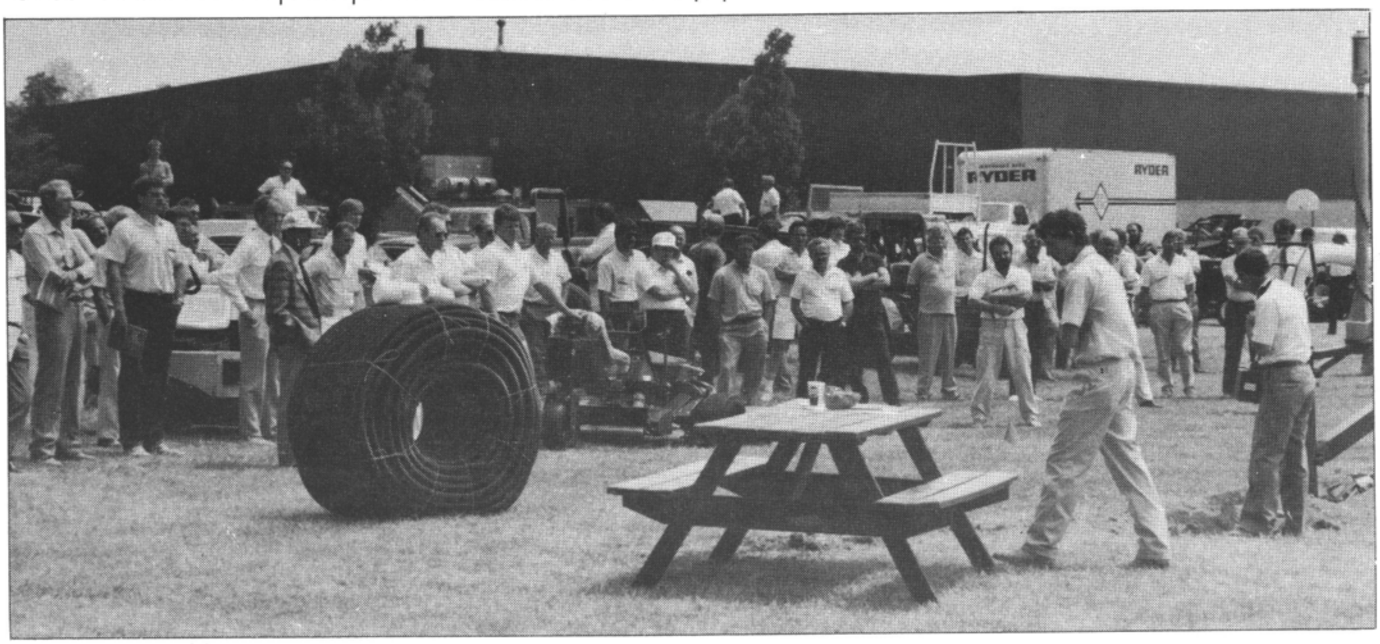
The afternoon provided the group with a first hand look at the practical application of various sports turf related equipment and the demonstrations allowed all present to see the equipment in use.

Finally, the "meet and mingle" portion of our programme provided individual members with the opportunity to discuss their own ideas and exchange new information.

Thank you for all your continued efforts and support.

Yours very truly,

Ron Dubyk



BASIC CONCEPTS OF LATE-SEASON NITROGEN FERTILIZATION

Dr. Anthony J. Koski
The Ohio State University
Department of Agronomy
Columbus, Ohio USA

Late-season nitrogen fertilization, sometimes referred to as late-fall fertilization, has been utilized by turf managers for years. This type of fertility program involves the application of much of the season's nitrogen during the late season months of August through December (dependent on location). It is important that late-season fertilization NOT be confused with dormant (or winter) fertilization. The latter method implies that fertilizer applications are made after the turf has lost most or all of its green color during late fall or winter and is not actively-growing. This differs notably from the late-season concept, which requires that nitrogen be applied before the turf loses its green color in the late fall.

Late-season fertilization has become popular because many of the agronomic and aesthetic advantages attributed to its use supposedly are not realized when spring and/or summer fertilization is practiced. Purported advantages of the late-season concept include: better fall and winter color, earlier spring green-up, increased shoot density, improved fall, winter, and spring root growth, and enhanced storage of energy reserves (carbohydrates) within the turf plant. Some claimed disadvantages include: increased chance of snow mold injury and decreased cold tolerance.

Effects on Turf Quality

Turf fertilized in September and again during October, November, or December generally has better fall and winter color than a turf which was not fertilized at that time. In addition, signs of spring green-up often are apparent two to six weeks earlier if the turf has been fertilized during the previous fall. Most importantly, the enhanced rate of spring greening is realized without stimulating excessive shoot growth that accompanies the early-spring N applications called for in some turf fertility programs. The winter color of turf fertilized only during the previous spring and summer months is decidedly inferior to that turf which also receives nitrogen fertilizer during the fall. The rate of spring green-up of grasss that has not been fertilized the previous fall is often slow, with acceptable color being attained only after N is applied during March or April. Turf color may then become equal to that of turf which received late-season nitrogen applications, but the excessive shoot growth which accompanies spring fertilization is undesirable.

At Ohio State we have found the spring color of late-season-fertilized turf to remain quite good until late May or early June, when the effects of N applied the previous fall began to "wear off". A 0.75-1 lb./1000 ft.^{2} (0.4-0.5 kg/100 m.^{2}) application of N is recommended at this time (late May-June) to maintain an acceptable level of turf quality throughout the summer period. In Canada, the spring application might be made (depending on location) anywhere from mid-May to mid-June.

It is important to remember that the N source used for the fall applications be of the type that is not dependent on microbial activity to effect nitrogen release. This means that fertilizers containing urea, sulfer-coated urea (SCU), IBDU, shorter-chain methylene ureas, and ammonium sulfate are ideal N sources for the late season applications. Although SCU and IBDU are referred to as controlled-release fertilizers, the rate at which nitrogen is released from thse fertilizers is mainly dependent upon soil moisture level and not on the degree of microbial activity. The use of microbially-dependent N sources for late-season N applications may not elicit the desired fall/winter color response because they do not provide enough available N for plant uptake when temperatures are low. However, these slow-release N sources would be ideal for spring and summer use. Examples of these would be natural organic N sources and fertilizers consisting predominantly of longer-chain methylene ureas (i.e., low in cold-water soluble N).

Research at Ohio State, however, has revealed no noticeable stimulation of fall or winter root growth in response to late season nitrogen applications. The true advantage that late-season fertilization provides to turfgrass root growth is realized during the following spring. Apparently, the root growth of turf fertilized during late-winter/early-spring declines soon after N application. Conversely, turf fertilized using the late-season concept becomes green early and rapidly, without the need for an early-spring N application, and root growth continues at a maximum rate. It appears that the excessive shoot growth encouraged by early-spring N applications utilizes carbohydrates that may otherwise be used by growing roots. Thus, late-season nitrogen fertilization does not actually *stimulate* root growth. It simply allows spring root production to occur at a maximum rate, without being interrupted by the negative effects of early-spring nitrogen applications.

Disease and Winter Injury

There have been claims made that late-season fertilization reduces turfgrass cold hardiness and may increase the risk of winter damage by the snow mold diseases. However, researchers in Ohio, Virginia, and

Rhode Island reported that neither probllem occurred in their respective studies. Nevertheless, both types of injury could potentially occur if high rates (more than 2 lbs. N per 1000 ft.^{2}; 1 kg/100 m.^{2}) of a quickly-available N source are used at one application date and/or applictions are not timed properly.

Why Timing is Important

For the late-season concept to work successfully, it is essential that the turf be green when the late (October or November) N application is made. In central Ohio, this means that 0.75 - 1.0 lb. N/1000 ft.^{2} (0.4-0.5 kg/100 m.^{2}) of quickly-available N (such as urea) should be applied during the latter half of September. This will ensure that the grass will remain green late into the fall when the other application will be made. It is also important, however, that excessive shoot growth not be encouraged by over-application of N during September. The production of lush, succulent growth may decrease cold tolerance and increase the incidence of the snow mold diseases during the winter and following spring. For the same reasons, the late (October/November) application should be delayed if an extended period of unusually warm weather (average daily temperature greater than 50°F; 10°C) is being experienced, or is forecast to occur in the near future.

Trying the Program

The accompanying table illustrates, for three Canadian cities, nitrogen fertilization programs which emphasize the late-season concept. Note that these are suggested programs which those superintendents interested in (but unfamiliar with) late-season fertilization may begin experimenting with. The suggested application timings are based on timings developed through research performed in Columbus, Ohio, USA and adapted to reflect monthly differences in temperature between Ohio and the indicated Canadian cities. As with any new or unfamiliar turfgrass management practice, evaluate it carefully on a small scale basis as a beginning point. Evaluate it under different conditions (different timings, various N sources, on fairways, tees, and greens, etc.) and over 2-3 years to determine its effectiveness/potential benefits as compared to your current fertilization program. Confer with fellow turf managers, consultants, or university personnel who may be familiar with the practice in your area and could offer suggestions on its implementation.

Effects on Carbohydrate Relations

Plant carbohydrate levels during early fall do not appear to be greatly affected by timing of nitrogen application. From December to February, however, the carbohydrate content of late-season-fertilized turf may be slightly lower than that of turf fertilized only during the spring and summer. Regardless of the timing of nitrogen application, carbohydrates are accumulated by the slowly-growing turf plant during the fall and winter months, reaching a peak sometime during the December-February period.

The early-spring (March-April) carbohydrate content of turfgrass plants fertilized the previous fall is often higher than that those of plants which did not receive late-season N. The ability to store energy at this time is a result of the earlier greening realized through the use of late-season N fertilization. Photosynthesis occurs in the slowly-growing, late-season-fertilized turfgrass plant, thus allowing it to accumulate carbohydrates.

As root and shoot activity and plant respiration rates increase during the late winter and early spring, plant carbohydrate content generally decreases. This decline may be quite significant when the turf receives an early-season (February-April) nitrogen application, as compared to grass that has not been fertilized since the previous fall. The rapid decline occurs because carbohydrates are needed to support the increased shoot growth resulting from N appli-

Suggestions For Establishing a Late-Season N Fertility Program

	City / Timing		
Application	Calgary	Quebec	Toronto
Spring (1 lb. N/1000 ft.^{2}) (0.5 kg. N/100 m^2)	mid-June	early-June	late-May
Late Summer (1 lb. N/1000 ft.^{2}) (0.5 kg. N/100 m^2)	early/mid-August	mid-August	early/mid September
Fall (1-2 lbs. N/1000 ft.^{2}) (0.5-1.0 kg. N/100 m^2)	early/mid-October	early/mid-October	early-November

cations made early in the season. Conversely, the more slowly-growing, late-season-fertilized turfgrass plants may possess a larger carbohydrate pool during the spring period. As will be discussed later, the process of spring root production can benefit from this greater concentration of carbohydrates.

Another possible advantage resulting from late-season fertilization is that the levels of stored carbohydrates are higher than those found in spring-fertilized turf as summer approaches. The higher levels of carbohydrates are desirable at this time of year since greater stress tolerance and/or increased ability to recover from pest-, traffic-, or stress-induced damage may be realized.

Effects on Root Growth

For years, researchers have claimed that fall and winter root growth of cool-season turfgrass species should be stimulated by late-season and/or winter nitrogen applications. It had been hypothesized that this would occur as fall temperatures declined to the point where root growth is favored over shoot growth. Researchers have shown that root growth of cool-season turfgrass species does indeed occur during the fall after shoot growth has slowed or ceased. This situation develops because roots grow qyite well when soil temperatures are between 40 and 65°F (4-18°C), while shoot growth is favored when temperatures exceed 55°F (13°C). In fact, some root growth will occur as long as the soil remains unfrozen.

DROUGHT STRESSED TURF IN SOUTHERN ONTARIO

Turf and plants in general are normally stressed during the hot, dry months of July and August, however, as we write this report, Ontario lawns, athletic turf and golf courses have suffered unprecedented high temperatures with minimal rainfall since May 22nd. Recent rainfall has alleviated the situation but we are not out of the woods yet since hot, droughty periods can still occur.

Turf managers should rationalize their approach to providing fields for fall activities, those with irrigation systems will be able to cope. What do those with severe water restrictions such as the Waterloo region, or no irrigation, do?

Fortunately most grass species in lawns are capable of withstanding drought by going dormant until adequate rainfall, shorter days and cool nights arrive. This capability for many turf managers can be a plus, in that annual bluegrass common in turf cannot survive such severe drought conditions and will not easily compete with other grasses at this time.

The general approach would be to boost growth in time with ideal growth conditions, i.e. apply a slow release fertilizer of a 3-1-3 or 4-1-4 ratio at .75 kg (1.5 lb) per 100m^2 (1000 ft.^{2}) in mid-August to early September.

There has been speculation that many fields will have to be resodded; we feel that this is not necessarily so, waiting until regrowth appears would be the wiser policy at the moment. No doubt sod will thin out in areas oriented towards the hot afternoon sun (west), on steep slopes and berms and on gravels or thin topsoils.

Observation indicates that turf under shade trees did not suffer as much as that in open stands which means that heat stress was more of a problem than soil moisture deficiency. For instance, Creeping Red Fescue, normally considered a drought-tolerant grass suffered considerably from heat stress. Another side effect will be the proliferation of crab grass due to thinning out of turf swards.

To produce acceptable playing surfaces, turf managers should consider a low cost program of overseeding, a technique which has been used on the University of Guelph athletic fields since 1981. The program involves slit seeding mixtures of the turf type perennial ryes and/or with Kentucky Bluegrasses during the last two weeks of August.

Seeding should be done in two different directions for adequate coverage; one can also aerate or verticut and apply seed with a spinner type spreader.

Depending upon the type of overseeding mixtures used, rates of seeding will vary from 2.5 kg (5.0 lb.) to 3.5 kg (8.0 lb.) per 100 m^2 (1000 ft.^{2}). Ryegrasses should be applied at the higher rates and those mixtures containing Kentucky Bluegrass at the lower.

These timely techniques plus a winterizer application of nigrogen at .5 kg (1.0 lb) actual N per 100 m^2 (1000 ft.^{2}) in late fall should carry our athletic turf in fine shape through the coming winter.

Norman McCollum
Pat Tucker
Guelph Turfgrass Institute

KITCHENER FACES $110,000 SOD BILL TO FIX DEAD FIELDS

By Joe Sinasac
Record Staff

Replacing the drought-stricken grass in Kitchener's major sports fields could cost more than $110,000 this year.

Tom Clancy, director of parks and property, made the estimate Thursday after Waterloo regional council rejected pleas by him and parks commissioner Fred Graham's plea to let the city do some watering.

"We have not experienced a drought like we have now," Clancy told reporters.

He estimated that replacing sod on 11 of the city's most used soccer fields would cost $10,000 to $12,000 apiece.

"We certainly have a problem, and it's going to cost dearly to replace these filds," Graham told regionnal councillors earlier.

"Some of our sports fields are dead, period."

Waterloo Region, along with much of Canada and the American Midwest, has been suffering through one of the worst droughts since the 1930s. A regional lawn-watering ban entered its 47th day today. Since May 22 only 44 millimeters of rain have fallen.

The average rainfall for the three months of May, June and July is 230 mm.

Heavy thunderstorms that were predicted for Wednesday and Thursday bypassed most of the region to the south. Storms were reported in Ayr, Brantford and Hamilton, but the weather office at Waterloo-Guelph Regional Airport recorded only 0.2 mm of rainfall at Breslau. Showers, however, are forecast for tonight after midnight annd Saturday.

Combined with not summer temperatures, the drought has frayed the nerves of residents, who in growing numbers have snitched on their neighbors for violating the lawn-atering ban. Some homeowners lucky enough to have wells on the property have taken to erecting signs to inform passers-by of that fact and plead with them not to call police when they see the sprinklers on.

And there is no end to the ban in sight.

In light of these conditions, regional councillors loudly denounced the Kitchener request to water sports-fields, saying it would undermine the conservation efforts the region has been making.

"We've got an extensive education program going on now to teach people how to conserve water," said Mary Jane Mewhinney, a Waterloo councillor.

"I really think there is a lot of nerve in the staff people from the City of Kitchener coming along and ruining these efforts . . ."

Fred Kent, a Cambridge representative on council, said most of the region's residents would resent seeing water sprinkled on playing fields when their own lawns are shrivelling in the heat.

"To grant any exception (to the ban) now would, I think, be doing the citizens a disservice," Kent said.

But Ald. Don Travers, a Kitchener representative, argued that lawns couldn't be equated with the playing fields, which represent a substantial investment to taxpayers.

The playing fields in question — four at Budd park, two at Woodside park, three at Breithaupt park and two at Centennial stadium — are each used by about 800 people each week. Such heavy use makes the fields more susceptible to heavy damage from drought, Graham said.

Kitchener's Ald. Jim Ziegler said the fields represent a business — "the sports business" — and should therefore be treated differently than lawns.

To salvage the fields, Kitchener officials banned soccer games indefinitely July 6 and are considering expanding the ban to baseball diamonds.

The officials also fear that many recently planted trees are doomed if no rain falls soon and they've asked residents to water city-planted trees in front of their houses wwhen it's their day for watering flower gardens.

Even the heavy rain Sunday and Monday was not enough to relieve the water-starved fields, Clancy said. The ground had been baked so hard during the previous weeks that much of the water simply drained away.

Clancy ssaid the city planned to water the fields about once every two weeks in the early morning hours, just enough to keep the grass alive.

While seeding the fields would be somewhat cheaper than sod, doing so would put those fields out of commission for a year, Clancy said. If the fields are re-sodded in September, they will be ready for use in spring.

He added that a University of Guelph expert had told him grass can remain dormant during a drought for up to eight weeks, and "we're in our eighth week now."

Council voted against the request 19-4, with the only supporters being Kitchener's Mayor Dom Cardillo and Aldermen Travers, Jim Ziegler and Gary Leadston.

Mesh Elements Added To Granular Soil Gives Root Zone Stability To Bermudagrass, Perennial Ryegrasses and Tall Fescues

The addition of randomly oriented interlocking mesh elements to granular soil has shown, initially, (1) substantial benefits to turfgrass root zone stability and, (2) enhanced turf growth. The mesh element matrices have a positive effect on soil aeration porosity which is important for root growth needed to intertwine with the mesh to achieve maximum turf stabilization.

Testing the potential benefits from the inclusion of randomly oriented mesh elements in turfgrass root zones was begun in August 1985 at the Texas A&M University Turfgrass Research Field Laboratory located at College Station, Texas. The turfgrass specialists listed on the Progress Report furnished ASPA were Dr. James Beard, Dr. Samuel Sifers and Dr. J.R. Walker.

The mesh elements were provided by Netlon Limited, Blackburn, England. Initial research and testings were done by a group of British turfgrass specialists, who have presented a number of Progress Reports at international conferences.[1]. The results of the American research will be published in the near future.

The initial tests were made with Tifway bermudagrass which has a very vigorous lateral shoot system of rhizomes and stolons. Further testing will be made on the other turfgrasses. Dr. James Beard reports, "I would anticipate that use of the mesh element-root zone system on bunch-type cool-season species, such as perennial ryegrass and tall fescue, would result in even greater beneficial responses."

Various items other than mesh elements have been used during initial experiments, including textile fiber, metal rods and plastic rods. The first tests indicate that the strengthening action of the mesh elements differs significantly from that of the other items.

The researchers mix the masonry sand and the mesh elements in a horizontal, conventional cement mixer. The test plot area was sprigged with Tifway bermudagrass. A topdresssing of sand was added.

Optimum cultural treatments are used. Following turfgrass establishment, the turfs were subjected to numerous tests of lateral shear displacement, compression displacement, divot resistance, sod strength, and rate of recover.

The preliminary results — which will be reported in detail later by the research team — are very positive. Investigation is continuing on an expanded scale.

Potential applications include sport fields, horse race tracks, car parks, golf cart paths, and other turfed roadways traversed by vehicular and foot traffic.

One concern for sod producers will be the possibility of a shorter growth period until time of harvest because of the root zone stability factor. As with netting for many sod producers, the bottom line may focus on ease of application and cost.

ASPA was sent the Progress Report but the research team asked that it not be printed in its entirety because more precise, scientific data will be published as soon as possible. However, Dr. Beard sent the following comments:

1. For horse race tracks, the rate of mesh inclusion which is performing best is 6 kilograms per cubic meters. This is based on experiences at the Sha Tin Race Track in Hong Kong. The extent of divoting damage at Sha Tin resulting from the use of the mesh element-sand root zone matrices has been reduced to less than 10% of what previously had been experienced.

2. The system will perform best if used in combination with a high sand root zone soil mix meeting USGA specifications.

3. Observations to date indicate that one of the big advantages of the mesh matrices-sand root zone system for sport fields is a very consistent playing surface regardless of growing conditions and the degree of rainfall and resultant soil moisture level.

4. This sports field root zone construction system involving randomly oriented interlocking mesh elements is one of the most promising approaches to providing a stable, consistently uniform playing surface under various types of weather conditions. Furthermore it retains the cushioning effect of a turf and thus provides a very desirable alternative in terms of offering some of the stabilizing characteristics of an artificial turf yet retaining the many beneficial dimensions of natural turfgrass.

[1] The British research specialists and their topics include:

A. **Andrawes, K.Z., A. McGown, N. Hytiris, F.B. Mercer, and D.B. Sweetland.** 1986. *The use of mesh elements to alter the stress-strain behavior of granular soils.* Proceedings 3rd International Conference on Geotextiles, Vienna, Austria. 3:839-844.

B. **McGown, A., K.Z. Andrawes, N. Hytiris, and F.B. Mercer.** 1985. *Soil strengthening using randomly distributed mesh elements.* Proc. Int. Conf. S.M.F.E., Balkema, San Francisco, USA. 11:1735-1738.

C. **Mercer, F.B., K.Z. Andrawes, A. McGown, and N. Hytiris.** 1984. *A new method of soil stabilization. Proc. Conf. of Polymer Grid Reinforcement, Thomas Telford, London, England. pp 244-249.*