SPORTS TURF MANAGER

... for safe, natural sports turf

AUTUMN 2006 • VOL. 19, NO. 3

STA FIELD DAY COVERAGE

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STA ANNUAL FIELD DAY PHOTO GALLERY...

More photos than ever! Turn to pages 11-13 and 17 to catch a glimpse of who was present at this year's event. We also are proud to publish two articles from popular Field Day speaker Dr. Andrew McNitt. His second begins on page 18.

OTS 2007 KEEPING IT GREEN...

February 19-20 in Guelph. Stay tuned for more details in the winter issue of the *Sports Turf Manager*!

Prioritizing Your Sports Field Maintenance

DR. ANDREW MCNITT, PENNSYLVANIA STATE UNIVERSITY

As the end of the season approaches, it may be a good time to evaluate the condition of your athletic fields. "What," you say? "They're not in the best of condition!" How could they be with the constant demand for fields, regardless of weather conditions, tight budgets, and you being spread too thin with your many commitments?

I've visited hundreds of high school athletic fields over the past couple years and I have a few comments on common mistakes, misconceptions and misdirected efforts. I'm going to suggest spending a little more money and in most cases, I really do mean a 'little more.' Your administrators should remember that the local taxpayers view the sports facilities more than any other physical item in the district other than the façade of the buildings and one lawsuit over an injured player may cost the district a hundred times the cost of some additional maintenance inputs.

Good Drainage is Necessary

So let's get started. First and foremost is drainage. If the crown of the field is worn out and the athletes are playing in a soup bowl, no maintenance procedure is going to help until you fix the drainage. Don't be fooled into installing some expensive underground drainage system – they usually don't work in native fields. I've seen school districts waste hundreds of thousands of dollars this way with less than desirable results. Sand-slit trenching can help if the sand trenches are installed... **cont. page 14**

If the crown of the field is worn out and the athletes are playing in a soup bowl, you need to fix the drainage.

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The President's Desk

GORDON DOL

Wow! What a Day!

On Thursday, September 21 we hosted our 19th Annual Field Day and as per usual, it surpassed all expectations. The educational program started with opening remarks from Dave Jenner, Assistant Head Master of Ridley College. Dr. Andrew McNitt from Penn State then covered *Sports Turf Drainage* and *Utilizing Compost on Athletic Fields*. After the break, Evan Elford, University of Guelph, took centre stage to discuss research he has been doing on *Competitive Turf: Overseeding for Weed Management*. After a great lunch, Dr. McNitt again took the podium and covered *Multi-Use Field Maintenance*. Following his talk, we had the equipment demo and trade show out on the field. This year we set an all-time record with approximately 200 people registered. We had 31 companies either sponsoring or participating with indoor and/or outdoor exhibits totalling 260 people in attendance.

Without the support of our members, suppliers and speakers, the day would not be the success that it is. Many thanks to Ridley College and Cam Beneteau, Manager of Grounds, for providing a superb venue. Great job, Cam! I would also like to thank Dr. Andrew McNitt who travelled from Pennsylvania State University, and Evan Elford from the University of Guelph. A very special thanks go to the Field Day Committee comprised of Jane Arnett-Rivers, Andrew Gaydon, Roy Forfar, Paul Turner, and Lee Huether – excellent work (Roy, we missed you)! Your hard work and dedication to this industry is the reason why our field days are always well attended and a great educational value. Thanks also to Andrew Gaydon who was the MC for the day and kept everything rolling along without a hitch. Please check out the articles and pictures from the event featured in this issue.

With the Field Day behind us, we're now preparing for yet another prime educational opportunity. Mark your calendars. OTS 2007 will be February 19 & 20, 2007 at the University of Guelph. The theme for this year is *Keeping it Green*. Stay tuned for more details.

Mark your calendars. OTS 2007 will be February 19 & 20, 2007 at the University of Guelph. This year's theme is *Keeping it Green*.

As mentioned in the summer issue of the newsletter, one of the goals of the association is to promote communication and professional development among sports turf managers. If you have any recommended topics for workshops or other educational ideas, please forward them to any board member or Lee at the STA office.

With all the rain that we have had this fall, I'm sure that everyone is knee-deep into the renovation of their sports facilities. While I know that it is frustrating when you are battling the weather, keep your head up… snow is coming! ♦

Online Job Ads

Are you advertising a position or searching for a great job? Visit www.sportsturfassociation.com and click on "Turf Trades" for info.

Coming Events

NOVEMBER 1, 2006

STA Scholarship Application Deadline

Info: (519) 763-9431
www.sportsturfassociation.com

2006 Scholarship Recipient
Wayne Wong
Kelowna, BC
Ontario Diploma in Horticulture (Turf Option)

November 14-16
Empire State Green Industry Show (Formerly NYSTA Turf and Grounds Exposition)
Rochester, NY
Info: (518) 783-1229
www.nysta.org

December 7
Ontario Recreation Facilities Association Annual General Meeting & Regional Information Session
Oshawa, ON
Info: (416) 426-7062
www.orfa.com

January 9-11, 2007
Landscape Ontario Congress 2007, featuring Fencecraft
Toronto, ON
Info: www.locongress.com

January 29-February 23, 2007
University of Guelph Turf Managers' Short Course
Guelph, ON
Info: (519) 767-5000
www.open.uoguelph.ca/turfmanager

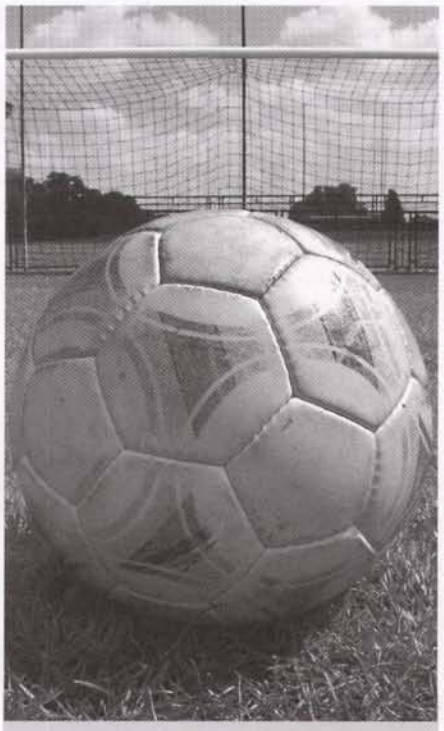
February 5-9
Turfgrass Producers International Midwinter Conference and Field Day
Queensland, Australia
Info: (847) 649-5555
www.TurfGrassSod.org

February 19-20
Ontario Turfgrass Symposium
University of Guelph
Guelph, ON
Info: (519) 767-5000
www.openuoguelph.ca/OTS

Spring 2007: Encore Presentation!
STA Proactive Water Use for Sports Turf Management: Implications of Municipal Water Restrictions
Watch for details!

GET ON THE LIST!

Contact the STA office if you have an event you'd like to advertise in the *Sports Turf Manager*.



Odds and Ends

STA Membership Plaques
Display membership plaques are available in executive engraved walnut for $50 plus S&H. To order, contact Lee at the STA office.

Winter 2006 Submissions
If you have something you'd like to submit for the next issue, please forward it to the STA office by November 3, 2006.

Editorial Content
Opinions expressed in articles published in *Sports Turf Manager* are those of the author and not necessarily those of the STA, unless otherwise indicated.

LATE FALL FERTILIZATION OF TURF

PAM CHARBONNEAU, OMAFRA TURFGRASS SPECIALIST

Early fall is an important season for turf growth and recovery and nitrogen fertilization is needed to accomplish this. Hopefully you have already applied the early fall nitrogen application. Late fall fertilization is also very important. It helps turf to overwinter, and it encourages root growth and early spring green-up. With the onset of fall temperatures, shoot growth stops, plants continue to photosynthesize, roots will continue to grow and the plant will accumulate carbohydrate reserves. This will allow the plant to store carbohydrates which helps it to survive the winter and promote early green-up in the spring.

It is essential to stress the importance of timing on the application of the late fall nitrogen application since the prime period producing optimal benefits may only last a couple of weeks.

Late fall fertilizing of turf offers many advantages:

- turf which stays green longer in the fall
- increased winter hardiness
- early spring green-up
- no need for early spring fertilizer and the flush of soft spring growth is avoided
- the first spring fertilizer application can be delayed until late May/early June

Principles of Late Season Fertilization

- Nitrogen is taken up by the roots even though shoot growth has ceased. This is because roots remain active at cooler temperatures.
- Nitrogen enhances fall colour and hence increases chlorophyll content.
- Increased chlorophyll content means increased photosynthesis.
- Increased photosynthesis means increased sugars. Since turf is not growing at the time of the fertilizer application, the sugars which are produced are not used for growth but are stored to enhance winter survival and spring recovery.
- Late season nitrogen promotes deep rooting during fall. Plants go into spring and summer with deeper, healthier roots.
- Spring green-up is early because the nitrogen stored in the roots is there ready when shoot growth resumes.

Timing

It is essential to stress the importance of timing on the application of the late fall nitrogen application since the prime period producing optimal benefits may only last a couple of weeks. With improper timing, the fertilizer will be either detrimental or ineffective. An early application (during mid-September to the end of October) will force succulent growth and tissue hydration which increases the turf's susceptibility to winter disease and low temperature kill. An application of nitrogen fertilizer when turf has already gone dormant will not produce the carbohydrates that promote root growth or allow the plant to produce and store carbohydrates that will result in early spring green-up. The optimal time for the late fall application is when the temperature has steadily lowered to the 10°C level. The shorter days and cool nights allow the plants to begin to accumulate carbohydrates more efficiently. The turf is still green at this point, the shoots are no longer growing, the roots are still growing and it is well before dormancy. Timing of application in the Guelph area is late October to early November. It could be up to a

Table 1. Rating of Nitrogen Sources for Suitability for Late Fall Fertilization.

Nitrogen Source	Analysis	Source of N	Suitability for Late Fall
Quick Release			
Urea	46-0-0	urea	Excellent
Ammonium nitrate	33-0-0	AN	Excellent
Ammonium sulfate	21-0-0	AS	Excellent
Ammonium phosphate	18-46-0	DAP	Good
Urea Formeldehyde Reaction Products			
Nutralene	40-0-0	methylene ureas	Good
Methylene urea	39-0-0	methylene ureas	Good
Nitroform (Gran.)	38-0-0	ureaform	Poor
Natural Organics			
Milorganite	6-2-0	activated sludge	Poor
Sustane	5-2-4	composted turkey litter	Poor-Fair
Ringer products	6-1-3	seed & bone meals, blood	Poor
IBDU	31-0-0	IBDU	Good-Excellent
Coated Materials			
Sulfur-coated urea	varies	urea	Fair-Good

New Members
WELCOME TO THE STA!

Larry Iafrate & Reid Paterson
City of Vaughan, ON

Mark Colpitts & Edwin Wile
Dol Turf Restoration Ltd.
Bond Head, ON

John Hollywood & Trey Sasser
Sasaki Associates, Inc.
Watertown, MA, USA

Jennifer Wacasey
Ecoval
Toronto, ON

Jason Ireton
Plant Products Co. Ltd.
Brampton, ON

Roch Robicheau
Kwik Goal Canada/Gemsport.com
LONGUEUIL, QC

Kurt Vanclief
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Jay Kivell
Jay Kivell & Associates
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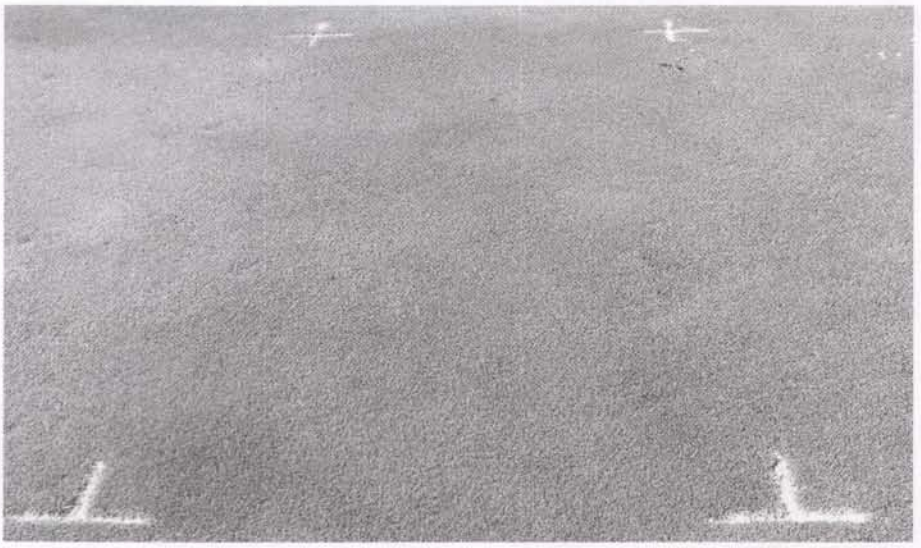
Lesley Swift
City of Kitchener, ON



Above: Darker green plots showing early spring green-up are those that received a late fall fertilizer application.

week later in the most southwestern part of the province and as much as a week to 10 days earlier in the northern part of the province.

Application Rates

The late fall application can range from 0.5-1.0 kg of N per 100m^2. The higher rate should be used if turf is very thin. On turf that receives heavy traffic, an application of potash in the late fall will also help the turf with overall stress tolerance. Potash rates should be applied according to soil test results.

Fertilizer Selection (See Table 1)

Water soluble or quick release fertilizer allows the nitrogen to be available to the plant regardless of soil temperature. If choosing a slow release form of nitrogen, no more than 25-30% of the nitrogen should be in a slow release form. Some examples of quick release forms that are suitable are urea, ammonium nitrate, ammonium sulfate, potassium nitrate and ammoniated phosphates. IBDU is considered a slow release formula of nitrogen, but it is well suited to the late fall application.

Environmental Considerations

Late fall fertilization has many advantages, but there are environmental risks associated with it. Late fall, winter and early spring brings precipitation which recharges the aquifers. Potential leaching of soluble substances such as nitrate is increased during these periods. It is no longer recommended on highly permeable soils, such as sand, to fertilize late in the fall. In these situations, slow release sources such as IBDU and sulfur-coated ureas should be used which help prevent leaching of nitrates. ♦

PREPARING YOUR IRRIGATION SYSTEM FOR WINTER

ANDREW GAYDON, VANDEN BUSSCHE IRRIGATION

Winterization consists primarily of expelling all of the water from the irrigation system piping and equipment. This is necessary since any remaining water would freeze during the cold weather and could break pipes, fittings, valves, sprinklers, and pump equipment.

Although most substances contract as they get cold, when water cools it contracts only until it reaches a temperature of 39 degrees F. Upon further cooling to 32 degrees F, water actually EXPANDS. At 32 degrees F it further expands as it turns from water to ice. Water expands and increases in volume by about one-eleventh, so that 11 cubic feet of water will form approximately 12 cubic feet of ice. This expansion force is sufficient to cause pipes and fittings to burst, valves to crack, sprinkler cases to split open, and other damage to the irrigation system.

The only way to ensure expulsion of all water from the system is by using compressed air to blow it out. Therefore, it is highly recommended to rent a compressor and "blow out" the system for winterization. There are also many irrigation contractors that offer this service. In this article, I will detail all of the steps that should be taken to prepare your irrigation system for winter.

1. Developing a Winterization Plan

A crucial part of the winterizing process is to have a **written winterization procedure** for your fields or park. The "blow out" process cannot be performed efficiently unless there is a logical approach prepared ahead of time. You want to avoid the endless pushing of water around in the system without actually expelling it. A written plan can be followed step-by-step by any member of your staff or personnel actually doing the air blow out.

2. Preparing the System

Be sure that you have an accurate "as built" drawing of your system with critical "high" and "low" elevations indicated. This "as built" drawing should also indicate the location of all zone shut-off valves (or zone isolation valves), all drain valves, all remote control valves, sprinklers, quick coupling valves, controller locations and areas they control, etc.

3. Understanding Air Compression

It is important to remember that **air volume and not air pressure** is the most critical element in blowing out a system. A sufficient volume of air is required to move the water through the pipe's full diameter. If an insufficient volume of air is used after having forced out some water, the air will ride up over the top of the water. This will result in the remaining water draining back into low points of the system, which will then be subject to freezing and likely damage to the system piping, fittings, sprinklers, valves and other components of the system.

4. Calculating Air Volume

The volume of air required will depend on your irrigation system. In general it will require somewhere between 100 to 250 CFM (cubic feet per minute).

5. Determining Air Pressure

The amount of pressure to use is best established by analyzing the system and determining the weakest part from a pressure rating standpoint. This can be quite low, perhaps in the 60 PSI range. You should **not** exceed this pressure and it is best to keep it somewhere below this level. Air pressures should be in the range of 40 to 60 PSI.

6. Controlling the Process

Although many compressors have pressure gauges and some type of pressure regulating device, it is still strongly recommended to install your own pressure regulating valve and pressure gauge at the point of connection into the irrigation system. This ensures that your devices are operating correctly and are accurate, where those on the compressor may not be. It also provides a very important back up and close monitoring to ensure proper operation during the blow out process.

7. The Actual Blow Out Process

Identifying the Point of Air Introduction into the System

Compressed air should be introduced at the highest point on the system. A 1" size inlet, equipped with a gate or ball valve, is adequate for sports and park systems. This connection should be steel or brass – not plastic.

Step #1

Shut off the water supply to the system. This may be as simple as closing a valve on the source of supply to your system or it might entail disconnecting your pumping station from your system. It is recommended, and this is a good time to check, that the valve is tied closed and a sign

placed on it stating it's "not to be opened" to ensure no one opens it during the winter shut-down period.

Next, open all drain valves, hose connection spigots and/or quick coupling valves. Allow your main lines to drain to low spots in the system. Disassemble several sprinkler heads at high spots to allow air to enter and speed up the draining process. This is best done several days before actually connecting the compressor to your system.

Step #2
Connect the compressor to your system at the high point. If possible, you want to always push the water down hill to the low points of the system.

Step #3
Activate the compressor. It is important that the operator be knowledgeable and thoroughly trained on its proper operation. This is an expensive piece of equipment and must be operated properly to prevent damage to it. The compressor and irrigation system should be slowly brought up to the desired operating pressure in order to reduce the possibility of surges and potential damage to the system.

Be patient and do not rush this process – it may take in excess of 10 minutes to get the system up to proper pressure and volume. It is important that the compressor have a high-pressure relief valve that you know is in good working condition. Also be sure to monitor closely to ensure that only the proper volume of air is being forced into the system.

CAUTION! Water is relatively non-compressible, but air is quite compressible and can develop characteristics that are more explosive and dangerous. Caution must be exercised when turning equipment on or off while the system is under air pressure. It is also strongly recommended that no one work directly on or stand over equipment or sprinklers while the system is under pressure and **always** have at least one valve open to allow air to escape while the system is pressurized. The compressor should **never** be left unattended while in operation.

Step #4
Zones within your system that are farthest away from the point of introduction of air should be blown out first. By doing so you will be able to eliminate a large percentage of the water from the main lines first. This in turn should speed up the process of blowing out the remainder of the zones. In order to avert the possibility of water running back into zones that have already been winterized, piping that is at the higher elevations should be blown out at the beginning of the procedure, followed then by zones in lower elevations.

Step #5
During the blow out operation, be sure to flag and record any pipe or fitting breaks, valve damage or sprinkler problems so that proper repairs can be made in the fall or spring before the system is "re-charged" for irrigation operation. It is suggested that

BOTH PICTURES OF HASTINGS BALL DIAMOND • COURTESY OF ENVIROIRRIGATION INC.

someone walk around the park and listen carefully as often you can hear the air escaping or see the air bubbling up from breaks in the piping or fittings, which you would not see under normal operation. This will be helpful in determining what materials you will need in the spring for proper repair. It will also eliminate the question as to whether this damage was done during the winter because of inadequate system blow out.

Step #6

If you have any backflow prevention valves on your system, they also need to have all water evacuated from them. Open and close drain valves and test cocks on the backflow preventers during the blow out process for the zone they are on. Also any rain shut-off devices that may be on the system should have their cup or collection sump emptied and either turned down or properly covered to keep any water out of them during the winter.

Step #7

After you have run a sufficient number of cycles so that only a mist is coming from the sprinklers on all zones, you are ready to shut down the operation. When shutting down, always leave several drain valves at the farthest end of the system open. Slowly close the flow control valve on the compressor until it is no longer pushing air. Then shut off the compressor.

Danger. Remember, do not disconnect while the connection may still be under pressure.

Step #8

Power down the controller (disconnect the transformer or main power) to prevent rodent infestation if located outdoors, or protect the unit by sealing all entry points. Anywhere where warmth is created by power being left on will attract rodents. Moth-balls are also a deterrent

8. Winterizing the Pump Station

A few simple steps can be taken each fall to ensure that the pumping station will be ready for operation in the spring. This includes making sure that all water is purged from the various sections and components of the pumping station. Whenever the temperature reaches 28 degrees F or lower for a longer period than 24 hours, you risk having freeze damage occur to the pumping station if water has not been purged properly from it.

Step #1

Refer to any manuals you may have on your pumping station for the manufacturer's recommendations on the proper way to winterize it.

Step #2

In addition to the pumping station manual, or in the event you do not have a manual, you should check and perform the following procedures. Open all drain valves and petcocks that are on the pumping station. If no drains are visible on the pumps themselves, or just for further assurance of getting the pumps drained properly, you can loosen the bolts on the flange and let the water drain from the pump. Also be sure to drain the pressure tank. Let the water drain by gravity from all areas of the pumping station. Be patient as this may take a considerable amount of time to ensure that all water has properly drained. Leave all drain valves open.

Step #3

With air, blow out all pilot tubing and all pilot valves on the main control valves. Leave the pilot tubing disconnected for the winter. Loosen the bolts of the main control valve bonnet to allow for draining. Tighten bolts and fill bonnet cavity with anti-freeze.

Step #4

Drain all the water from the various pressure switches. Blow out the tubing and leave all tubing disconnected for the winter.

Step #5

Check all piping connections and fittings for leaks or other repairs that may be required to put your pumping station back into good working order. This should include checking all mechanical connec-

tions for tightness. Check all seals, gaskets and hoses and replace any that appear to be failing or show aging or hardness and that may not be sealing properly or that look like they may soon fail. Preventive maintenance can be the least costly in the long run and can eliminate the possibility of down time right in the heat of the season when you can least afford it.

Step #6
Check all electrical connections. Inspect all electrical components in the controls for your pumping station. Replace any components that you know are bad and any that are suspect for failing in the near future. Again, preventive maintenance can be the most economical in the long run.

Step #7
Use steel wool or emery cloth to remove any rust deposits on the pumps, control valves, control panels, and piping of the pumping station. Use a high-quality, rust inhibitor type paint to cover all rusted and/or paint chipped areas.

Step #8
Grease all fittings on the pump station. If you have turbine pumps be sure to also change the oil in them. On centrifugal pumps, drain the water from them through the lowest drain plug on the volute of the pump.

Step #9
Aluminum intake lines should be removed for the winter to prevent electrolysis. Be sure to clean the interior and the exterior of the inlet or the foot valve. If you have a wet well, this is a good time to clean it of any debris and also to clean the inlet filters.

Step #10
If your pumping station is exposed, it is recommended that you cover it with a canvas to protect it from the elements and help prevent rusting. A plastic cover is not recommended as it causes condensation under it and will only aid the rusting process.

Other Pump Station Tips
If your pumping station is in a pump house, you may want to consider heating the pump house with a heater to maintain from 40 to 50 degrees F temperature all winter long. In some of the more moderate winter areas, thermostatically controlled heat tape can be used to provide this added protection and assurance.

Keep in mind that winterizing the pump station properly and making sure it will survive the winter successfully will ensure you that it will be ready and in good working order in the spring. It can reduce your replacement costs which can be quite high if you sustain a lot of damage to the pumping station due to winter freeze failure. In addition, you can eliminate the delay in getting your system back into operation in the spring due to needed pump station repairs In conclusion, your time and efforts dedicated to the winterization process are well spent for both the long-and short-term care of your irrigation system. ♦

19th Annual Field Day

SEPTEMBER 21, 2006 • RIDLEY COLLEGE • ST. CATHARINES

The historic grounds of Ridley College provided a fitting setting for an event which proved significant in the annals of the Sports Turf Association. The popularity of the Field Day increases every year and attendance soared for the Association's 19th Annual Field Day held September 21st, 2006. Our thanks to the College, Cam Beneteau, and his crew for having us. It takes an incredible amount of preparation and organizing to do so and we appreciate the efforts of our host venue.

Close to 260 turf managers, students and industry suppliers travelled to St. Catharines for the occasion. Attendees journeyed to the Garden City from all compass points: Barrie, Welland, Belleville and London. Speakers Andrew McNitt and Evan Elford joined us from Pennsylvania State University and the University of Guelph to share their knowledge and expertise. We were also pleased to welcome first year students from the U of G's Associate Diploma in Turfgrass Management Program. They are the future! Our industry suppliers, as always, were magnanimous in their participation and support. It is through their generosity that we are able to present a first rate opportunity for professional development and networking at an affordable price.

Mother Nature must be a turf manager as she always pulls through for our Field Day! On the following pages, we feature articles by Dr. McNitt and an event photo gallery.

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MORE PICTURES DISPLAYED ON P.17

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PRIORITIZING YOUR SPORTS FIELD MAINTENANCE

CONTINUED FROM THE FRONT COVER • FIRST OF TWO ARTICLES BY STA FIELD DAY SPEAKER DR. ANDREW MCNITT

... the whole way to the field surface and are properly maintained (note that they are rarely properly maintained). But the real solution is to bite the bullet and regrade the field. Either strip the sod or have someone Blekovate it. While you're at it, add some high quality compost and till it in. I've listed some web references at the end of the article to help you choose a high quality compost. Put a good crown on the field. A 1.5% slope minimum is recommended. This size slope will not significantly interfere with soccer and will move water off the field surface. Your high wear areas should be the on the high points of the field. Don't 'lean' the field from one side to the other. Have the field crowned so the middle section between the hash marks is the highest point.

You will have to resod. That's right – it's not cheap but it is the correct way to do it. If you can limit play in the spring, you can sod in December and 'may' be able to have some light traffic (track) on it in the spring. I would strongly recommend 'thick-cut' big-roll sod where the sod soil layer is 1.5 inches or so. This is an additional expense but will allow almost immediate play.

You Can't Mow Too Often

OK, let's say your drainage is adequate. What's next? The answer is mowing. Mow often with good equipment. What is often? Three times per week is not too much. That's right, three times per week during seasons of active turfgrass growth. This is one of the most effective ways to increase the quality of your turf. If you can't mow at least twice per week (preferably three) there isn't much use in instituting the next couple items on the list. People

often ask me, "How do golf courses keep the fairways so nice? They must be adding a lot of chemicals!" Incorrect, other than high-end courses, most golf courses can't afford chemicals for their fairways. They maintain that tight grass by mowing with a high-quality mower every other day and by fertilizing and watering.

Since mowing is probably the most labour intensive turf activity, get an efficient mower. I've visited many schools that still use a belly mower mounted under a tractor. Very slow! An out front rotary mower is typically the best fit for high schools. Keep the blades sharp! A sharp blade makes a clean cut and actually helps the grass to grow faster and after all that's what we're after – fast growing turf that can recover from all the foot traffic. You may need additional personnel to be able to mow this often. I know that personnel issues are tough with all the politics in a school district but see if you can get a couple volunteers to do some seasonal mowing for you or out-source your mowing. It's important. Now, what about mowing height. Two inches is a good height for high school athletic fields. Maybe you can go to 2.5 inches but no higher. Also, don't raise the mowing height in the summer and lower it in the spring and fall. Just pick a mowing height and stick with it.

Get an efficient mower and keep the blade sharp. A sharp blade makes a clean cut and actually helps the grass to grow faster and after all, that's what we all want – fast growing turf that can recover nicely from all foot traffic.

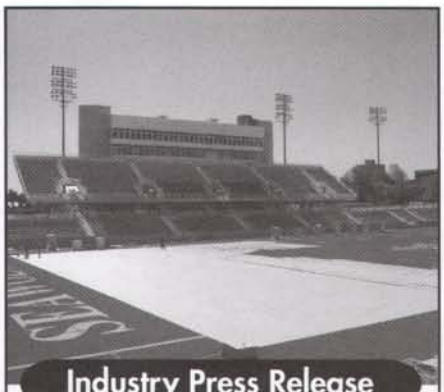
Nitrogen Fertilizer

After mowing, the most important item is fertilizing, especially with nitrogen. Very few school districts are applying enough nitrogen fertilizer. We recommend between 4 and 6 pounds of actual nitrogen per thousand square feet per year on heavily used athletic fields. That's a lot considering that if you follow the label on most turf fertilizers you are applying about one pound of nitrogen per application. I've found that most school districts average about two pounds of nitrogen on the high profile fields and less on lower profile fields. The reason? The field manger knows that if they apply more nitrogen, they will never be able to keep up with the mowing, that's why having the ability to mow often is critical. It's tough to get through a whole season of football when you're starving to death! For more information on fertilizer types and timing see the references below.

While we're at it, don't buy into all the silver bullet products being peddled to sports field managers. If it's too good to be true, it probably is. Spend your money on simple fertilizer and mowing.

Overseed Often

Next, seed – seed all the time! Should you overseed in February? Yes. Should you seed in April? Yes. Should you seed in May? Yes. Should you seed in August? Yes. Should you seed in



Industry Press Release

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between football games in the fall? Yes. Should you seed at Thanksgiving? Yes. Seed all the time! Use good quality 100% perennial ryegrass seed. Don't mix species. There is no reason to have any Kentucky bluegrass in a seed mix that is being applied to a field in use. It won't come up and it's expensive. Pick a top quality seed and buy a lot. Is 20 pounds of seed per thousand square feet per year too much? No. Seed.

Seed and fertilizer are not expensive, especially if you pick the right kind. Mowing is expensive, but there is no use fertilizing if you can't mow and there is no use seeding if there is no food present for the young seeds.

Irrigation & Aerification

Next, if you can afford it – install irrigation. Your fields are being beat in the spring and the fall. One of the only times you can get the grass to recover is during the summer (not an ideal time) if you have water. This will not solve all your problems and may create some new ones (insects and disease) if not done correctly but it can significantly increase your recovery and provide a dense strong turf heading into the fall season.

OK, we're finally on to aerification. Hollow-tine aeration (core aeration) is the best. Spikers are better than nothing but don't compare with removing a core. Use big tines (0.75 inch diameter). Go over the field until you have a hole on two inch centres. When should you do this? The text books tell you to do it when the turf is actively growing (spring and fall) but that is when you have sporting events. You can't do it then. Many school districts have found that aerification after the last event in the fall works very well and that a **1/4** inch application of a high-quality compost just prior to aerification really helps. Again, check out the references below for proper compost selection and application.

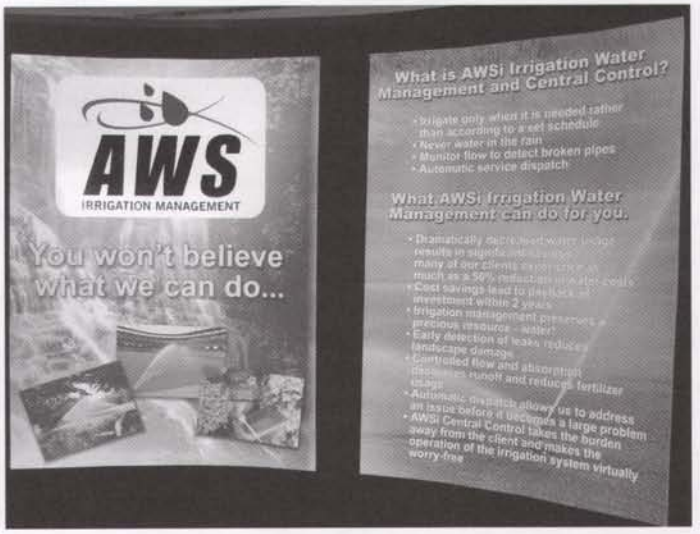
There is no way I can cover everything you need to know when caring for a high school athletic field in this article. Hopefully, I've help you set some priorities and most importantly provide sources of information. Get educated! Finally, take some pride in creating safe and playable surfaces for your student athletes. ♦

References
(note that most are US-based)

- Keystone Athletic Field Managers Association: kafmo.org
- The Pennsylvania Turfgrass Council: paturf.org
- Penn State Cooperative Extension: http://www.extension.psu.edu/extmap.html
- Turfgrass Seed Varieties: ntep.org
- Information of compost applications, fertilizer and lime: http://turfgrassmanagement.psu.edu/proturf.cfm

Dr. Andy McNitt is assistant professor of soil science/turfgrass at Pennsylvania State University. He can be reached at asm4@psu.edu.

FIELD DAY PICTURES CONTINUED



19th Annual Field Day

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See You Next Year...

UNDERSTANDING FIELD DRAINAGE

YOU CAN ELIMINATE PUDDLES ON YOUR FIELD • DR. ANDREW MCNITT, PENNSYLVANIA STATE UNIVERSITY

Imagine you're one of the grounds managers out there with a water problem, puddles recurring on your field after a rain. What's the best way to fix the problem?

Some choose what seems a logical approach. Dig a trench across the field, lay in some drainage pipe, cover it with gravel, then backfill with the spoil and wait for the next rain to watch your water troubles drain away.

But all you may have done is succeed in draining your maintenance budget. If there's a puddle on the surface, a pipe 10 feet underground isn't going to make it go away. The water can't move through the first two inches of the soil. If it could, you probably wouldn't have the puddle. This type of 'fix' is too typical when trying to solve a drainage problem.

A better solution is to improve the surface drainage. Put a good crown on a natural soil field to move the water to the sidelines and then collect and get rid of it. I know this is an expensive solution, but it's the best solution. Fight hard for a 1.5% slope. Don't let the architect lean the field from one side to the other. You want to move the water the shortest distance possible off the field and you want the high wear areas to be the highest, and driest, areas of the fields. If you are draining a football-only field, you can 'turtle hump' the field. That means that you run the traditional crown on the field until you reach the 20-yard line. Then the shortest distance off the field is to run the water out through the end zone. This is not a good idea for any sport that uses a goal, i.e. soccer, field hockey, lacrosse. If a goal sport is to be played on the field, run the crown the entire length of the field. You don't want to run water toward the goalmouth. You want the goalmouths to be sitting on the highest part of the field.

Unless there's a high water table, most fields will not be helped by a subsurface drainage system. If you're in the rare situation that calls for subsurface drainage, find an expert such as a hydro-geologist or civil engineer with experience in draining high water tables. One thing about draining a high water table: You want the pipes as close together and as deep as you can afford. Remember, draining a high water table will help in the spring or other times the water table is high, but will not necessarily take care of surface water problems caused by a passing thundershower. Good surface drainage is still needed.

Finding a Way Out

Of course, moving the surface water to the sidelines is only part of the answer. Once there, the water should be collected and drained away. If you just put three or four small grates along each sideline, the water sometimes has a tough time finding the inlets. The grates sometimes end up being 4 inches higher than the surround-

Above Left: Implementing the right measures will eliminate surface puddles on your field. **Above Right:** Drains behind the bench area at Beaver Stadium.

The mistake some managers make is running pipe under a native soil field and capping the last six inches of the trench with the topsoil they removed. I found many of these systems seldom conduct water through the pipes for very long. Once that surface soil becomes compacted, the water can no longer make it to the drainage pipe.

ing turf and the water can't get into it even if it can find the grates. Beaver Stadium on the Penn State campus has drains behind the benches that run the length of the field and work well. These Jiffy Drains are essentially PVC pipes that have been split in half and set only a couple inches into the ground forming a ground level rain gutter. The gutter is then covered with a grate. The channel connects to an outlet, which leads the water to a storm sewer. Initially, the grounds crew was worried that frost would heave these gutters out of the ground each winter. That has not been the case. This system has been in place for 12 years and continues to function well. Each spring the crew pulls the grates to hose out debris in the channel.

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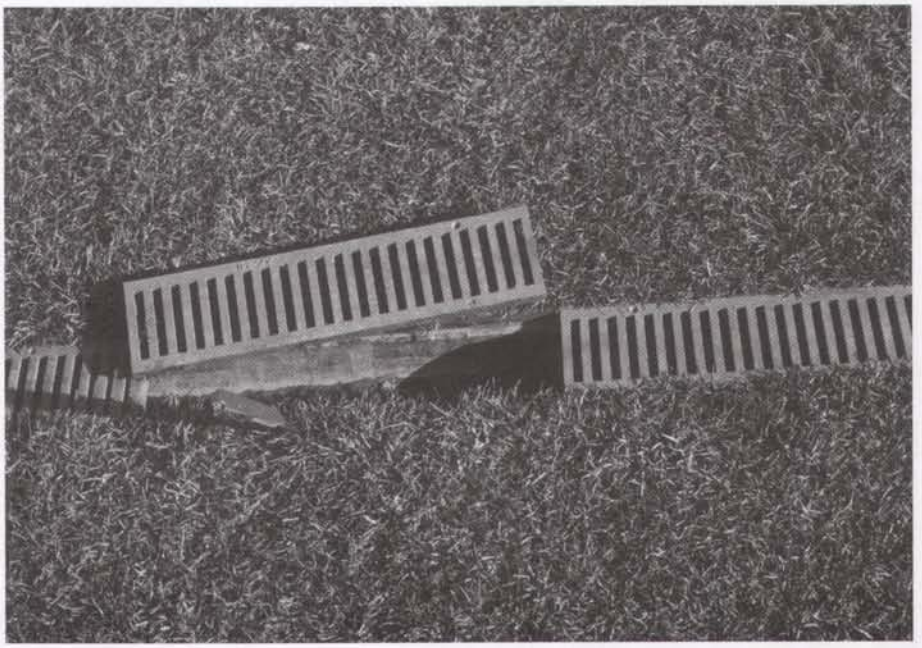

Above: Close-up of split PVC and grate system at Beaver Stadium. Note that both stadium pics are pre-expansion.

Slit Trenching

Another solution for improving drainage that is useful is installing drainage lines using one of the many slit trenching systems now available. Be sure the trenches are constructed so that the coarse aggregate (sand) comes the whole way to the playing surface.The coarse aggregate

cannot be topped with soil or the system will fail. The trenches these systems create should run perpendicular to the way the water flows, end zone to end zone, in order to catch the water as it runs off the crown. Contractors don't always like to do this because they have to create more fall in the trench. Running the length of

The trenches these systems create should run perpendicular to the way the water flows, arranged end zone to end zone.

the field means now they need 65 yards of fall, but going sideline to sideline means they only need 25 yards or so. A herringbone system is a workable compromise. Collection pipes run the length of each sideline and the slit trenches run at a 45-degree angle off of each collection pipe.

A common mistake made is installing a slit trench system and then maintaining the field as you had in the past. When core aerating, if you bring the cores to the surface and then drag them back into the field, eventually you are going to dirty the sand in those drainage channels and plug them up. You will eventually 'cap' the trenches with soil. Once the slit trench system is installed, it's time to start sand topdressing and removing aeration cores. I suggest topdressing immediately after the slit

Above: Installing a grid drainage system.

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trenching is installed. To be ready for fall sports, you should put down about 3/8 inch of straight sand across the whole system in spring. Run some test strips in the field surrounds until you become calibrated. This is a lot of sand. It looks like you are burying the grass. The grass will grow through the sand and in four days you'll be mowing again so don't be too concerned. You shouldn't plan on playing on the newly topdressed turf for some time. The grass needs time to 'secure' this new sand topdressing.

In addition to straight sand topdressing, when it's time to aerate, harvest the cores each and every time and then topdress with sand again. You'll be treating the field like a push-up green and you must sand topdress every year and you must pick up the cores. You build up that layer of sand on the surface with the trench system under the sand. This can provide you with the best of both worlds – a quick draining firm surface but the roots will still be able to find the native soil underneath for nutrients and water.

This approach is a great way to go but it does require more money to maintain the field. You'll need to purchase sand every year, you'll need a large capacity topdresser, and one of the new core harvesters. It moves you to a higher level of maintenance, but remember the worst thing you can do is spend money on a trench system and maintain the field the way you always did. If you don't core aerate, or you do core aerate and drag the plugs back into the field, eventually the trench system will clog and stop working. ♦

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A common mistake made is installing a slit trench system and then maintaining the field as you had in the past. When core aerating, if you bring the cores to the surface and then drag them back into the field, eventually you are going to plug your drainage channels.

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