

Sports Turf Manager

FOR BETTER, SAFER SPORTS TURF. SPRING 2017. VOL. 30. NO. 1.

The Crumb Rubber Concern; Where Are We Now?

Certainly since April 2016, but also for several years before that, there has been considerable concern and discussion raised regarding the impact on an athlete's health when playing on artificial turf with recycled crumb rubber. The issue was originally raised in 2008. As per Wikipedia: Crumb rubber is recycled rubber produced from automotive and truck scrap tires. During the recycling process, steel and tire cord (fluff) are removed, leaving tire rubber with a granular consistency. Crumb rubber is often used in artificial turf as cushioning.

The information on crumb rubber's effects on athlete's health may have been challenging to decipher. What are parents and coaches to believe?

Both parents and coaches have reviewed studies found on the internet to educate themselves on the findings of health concern allegations. NBC News' feature on "*How Safe is The Artificial Turf Your Child Plays On?*" October 2014 states:

Soccer coach Amy Griffin was in a Seattle hospital visiting a young goalie who was receiving chemotherapy when a nurse said something that made the hair on Griffin's neck stand up. It was 2009.



Two young female goalies Griffin knew had been diagnosed with non-Hodgkin lymphoma. Griffin, associate head coach for the University of Washington's women's soccer team, had started to visit the women and other athletes in local hospitals, helping them pass the time during chemo with war stories from her three decades of coaching. That day, the nurse looked down at the woman Griffin was sitting with and said, "Don't tell me you guys are goalkeepers. You're the fourth goalkeeper I've hooked up this week."

This NBC news feature indicated "more research should be done" as conclusions, from past studies, have been limited.

USA Today, October 2015, the article "*Washington soccer coach seeks link between artificial turf, cancer*" quotes "why won't the government say whether this artificial turf is safe?" The article claimed: "Both Griffin and the turf companies would like to see the debate settled one way or the other, but while the Environmental Protection Agency suggested "more work needs to be done," the federal agency has done nothing." The EPA told NBC it's a state matter, and Griffin's home state of Washington is currently conducting research.

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President's Message

BY TAB BUCKNER

It's the beginning of spring and once again Sports Turf Canada is well underway in planning for 2017. In the past year we have seen several changes:

- we launched our new website (www.sportsturfcanada.com) which has provided greater awareness of what we do as an association
- we held a joint field day in Calgary with the Western Canada Turfgrass Association.

This was a very well attended event with lots of learning and networking and it signified our mandate of being a national sports turf association in partnership with regional based associations.

- sadly we had to say goodbye to Lee Huether, who was STC's Executive Manager for 19 years who is now thoroughly enjoying retirement, and we are welcoming Anne Baliva as her replacement

This year we have implemented a number of member surveys to gather your feedback. Please watch your emails for links. I am very happy to see that this magazine, Sports Turf Manager, is one of the highest valued benefits of membership. Thank you to all our content writers, advertisers and editors who support our magazine quarter after quarter. It truly is a well-regarded resource.

The Ontario Turfgrass Symposium in Guelph this year was a great success and I wish to thank all those who supported the Sports Turf and Recreational Facilities sessions. Thank you to Jason Inwood, Roger Macklin and Rob Wagner for providing the successful panel presentation on "How to sell your turf management program on a limited budget".

I would like to extend my welcome to Mike Rossi of Turf Care Products Canada, as STC's newest Board Director. We look forward to his skills and past experiences assisting the Board in accomplishing our goals.

This year we will have three Field Days, yes I said three. One in Moncton, NB hosted by the City of Moncton, one in Langley BC hosted by the Township of Langley and of course our annual one in Ontario. This year's Ontario Sports Turf Field Day is being hosted by the Town of Richmond Hill. All will be held in September and I encourage all our members and others within your area to attend.

And in closing, I encourage all of our members to share the benefits of your membership with others in the industry and plan to attend our Field Days and other events for further information and speaking with others in the industry. Looking forward to our year ahead! - Tab



*President Tab Buckner at Sports Turf Canada's
30th Anniversary AGM – BMO Field, Toronto*

Event Calendar

May 30

Sports Turf Canada Robert W. Sheard Scholarship Deadline

sportsturfcanada.com

September 6

Atlantic Canada (New Brunswick) Field Day

Hosted by: City of Moncton – population: 69,074, a bilingual city in the hub of the Maritimes. Magazines have ranked them polite, honest, intelligent and one of Canada's Top 5 Best Places to Live.

Where: The CN Sportplex – a large recreational facility which consists of ten baseball fields, six soccer fields, and four indoor ice rinks, including the Superior Propane Centre. Also on site is the Dundee Sports Dome, a large air supported structure which offers paintball, golf, soccer and football.

September 14

Central Canada (Ontario) Field Day

Hosted by: Town of Richmond Hill – a town in south-central York Region, Ontario. Part of the Greater Toronto Area, it is the York Region's third most populous municipality and the 28th most populous municipality in Canada.

Where: Richmond Green Sports Centre and Park is a town-owned and operated facility consisting of an arena with 2 ice pads, Sports Hall of Fame, 4 softball diamonds, open picnic areas with shelters, 3 baseball diamonds, a 26,000 sq ft indoor sports complex, 4 mini soccer pitches, 1 pro regulation size soccer playing field, 2 agricultural barns and paddocks, skate park and a water play park.

September 20

Western Canada (British Columbia) Field Day

Hosted by: Township of Langley - a district municipality immediately east of the City of Surrey in southwestern British Columbia, Canada. It extends south from the Fraser River to the U.S. border, and west of the City of Abbotsford.

Note: A Joint effort with the Western Canada Turfgrass Association (wcta-online.com)

Where: Aldergrove Athletic Park (AAP) – also known as Kinsmen Park (Aldergrove) and consists of: a ball hockey rink, baseball diamond, basketball court, football field, hockey field, rugby field, skate park, soccer field, tennis court and a track and field oval.

NEW & RETURNING MEMBERS

Alberta

Casey Mahan
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Marcus Dietz
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Whitchurch-Stouffville

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Newfoundland and
Labrador
Leon Organ and
Mike Adam
City of St. John's

Matt Morrison
City of Brantford

Sports Turf Manager

FOR BETTER, SAFER SPORTS TURF. SPRING 2017.

“Fresh cut grass smells like twilight in the countryside, a football game about to start, or a sunny Saturday morning in the suburbs.” – Anonymous



Inside this issue...

REGULAR COLUMNS, DEPARTMENTS & SMALL FEATURES

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Event Calendar: Field Days Announced

Opinions expressed in articles published in Sports Turf Manager are those of the author and not necessarily those of Sports Turf Canada™.

Deadline for Summer 2017 Sports Turf Manager: May 26

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WHAT'S ONLINE
SportsTurfCanada.com

**Check out our field day
schedule for 2017 –
something for everyone!**

Continued from cover

Paul Steinbach, Senior Editor of Athletic Business's article titled *Turf Industry Bolsters Defense of Crumb Rubber Safety* reviews the issue and identifies the video titled "*The Truth About Crumb Rubber and Artificial Turf*" by Safe Fields Alliance and the Recycled Rubber Council. The video states that "there are dozens of scientific, peer-reviewed studies conducted by leading academics, state health agencies and third parties."

States like Connecticut, Massachusetts and Washington have conducted studies and looked at research and found no safety concerns.

Since these reports, the following studies have been conducted: From the Washington State Department of Health (DOH) in January 2017: Synthetic Turf and Crumb Rubber report concludes: "This investigation and available research do not suggest that playing soccer on artificial turf causes cancer. Thus, the Washington State Department of Health recommends that people who enjoy soccer continue to play irrespective of the type of field surface."

Assurances of safety, however, are limited by lack of adequate information on potential toxicity and exposure. The Washington State Department of Health will continue to monitor new research on health and environment impacts of crumb rubber."

Athletic Business reported on a "*European Report: No Need for Crumb Rubber Concerns*" by European Chemicals Agency (ECHA) from March 2017. The article says "In compiling its report, the ECHA considered exposure by skin contact, ingestion and inhalation, and concluded that "there is at most a very low level of concern."

The conclusions corroborate the results of previous studies, including the January study conducted by the Washington State Department of Health that found no links between turf and cancer risk.

CTV News reported on a Dutch study: "*Synthetic fields with rubber crumbs are safe.*" The report states: "The National Institute for Public Health and the Environment published a report saying that the health risk from playing on such fields, which are common throughout the Netherlands and elsewhere as low-maintenance alternatives to natural grass, is "virtually negligible."

The Dutch soccer association welcomed the findings, saying they gave clarity to sports clubs and players. Many clubs across the Netherlands had stopped playing on rubber crumb fields since a television program in October raised concerns about health risks.

The United States Environmental Protection Agency is also undergoing a study: *Federal Research on Recycled Tire Crumb Used on Playing Fields*, which is still ongoing. On December 30, 2016, the agencies released a status report describing the progress of the research to date. Recent update states: "The status report does not include research findings. For the characterization of the chemicals research, tire crumb material has been collected from tire recycling plants and synthetic turf fields around the U.S. Tire crumb samples have been gathered from nine tire crumb recycling plants, 19 fields located on US Army installations and 21 community fields including both indoor and outdoor fields. Analysis of the tire crumb samples collected from fields and recycling facilities, and the exposure characterization component of the study will continue in 2017. Parts of the exposure study may be conducted during the hotter months of 2017. The CPSC playground study also will continue in 2017."

While this effort won't provide all the answers about whether synthetic turf fields are safe, it represents the first time that such a large study is being conducted across the U.S. The study will provide a better understanding of potential exposures that athletes and others may experience and will help answer some of the key questions that have been raised.

November 30th, 2016 Newswire announced: *Leading Recycled Rubber and Synthetic Turf Industry Group Members Voluntarily Move to Adopt Key Safety Standard*. The report announced: "Leading members of the recycled rubber and synthetic turf industries today announced that they are jointly cooperating to ensure all synthetic turf and playground infills meet new ASTM (American Society for Testing and Materials) toy standards for heavy metals to further ensure safety for youth athletes."

ASTM International is the leading global standards organization, establishing industry-wide standards across a wide range of materials, including for all toys sold within the United States. With today's announcement, all synthetic turf field and playground infill created and used by leading members of the Recycled Rubber Council, Safe Fields Alliance and Synthetic Turf Council will comply with F3188-16, the Standard Specification for Extractable Hazardous Metals in Synthetic Turf Infill Materials. This comes in addition to products already meeting standards set by the European Union." •



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Supporting OTRF Research

The Ontario Turfgrass Research Foundation (OTRF) focuses on financially supporting research that ensures sports fields are sustainable in Canadian communities so players can enjoy the spirit and health benefits of sports. The OTRF, along with other Canadian turfgrass research foundations, through charitable donations, support research in turfgrass sustainability. With 35 years of experience raising money for turfgrass research, the OTRF have allocated over 1.2M in the last 10 years to turfgrass research.

Drawing from our mission statement of supporting scientific research of turf culture for the advancement of the turf industry, our Board of Directors works tirelessly to raise money to fund research projects that improve turf management.

Research into the use of probiotics for dandelion control,

improving plant stress resistance to combat disease pressure, sustainable low pesticide input best management practices, cultivar selections and microbial inoculants and improving grass establishment are just a few of the ways that the OTRF supports turf managers.

The OTRF is currently sponsoring an Olds College project that will determine ideal topdressing volumes and application frequency of compost and compost teas. For a field manager, the recommendations from this study will help prevent the seasonal wear that Canadian sports fields are plagued with throughout the growing season. Through donations to charitable turfgrass research foundations such as the OTRF, we can continue to provide our future generations with healthy green spaces to work, play and live.



Anne Baliva presents a cheque to Sean Gunn, President of OTRF

Congratulations to Sports Turf Canada's 2017-2018 Board of Directors:



L-R: Eric Lyons, University of Guelph, ON (Advisor); Tennessee Propedo, City of Hamilton, ON; Roger Macklin, Retired from City of Toronto, ON; Tab Buckner, Township of Langley, BC; Mike Rossi, Turf Care Products Canada Ltd, ON; Jason Inwood, Town of Innisfil, ON; Ben Tymchyshyn, R.F. Binnie & Associates Ltd., AB; Ken Pavely, Lawn Life, ON; Paul Turner, G.C. Duke Equipment Ltd., ON; Stan Kazymierchyk, Kwantlen Polytechnic University, BC; Gord Dol, Sports Turf International, ON; Gord Horsman, City of Moncton, NB Absent: Terry Henderson, City of Hamilton, ON; Dwayne McAllister, City of Oakville, ON, Paul Gillen, Retired from Wood Bay Turf Technologies, ON



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The Future of Sports Field Lighting

Robert J. Nadalin, MIES



By now, virtually all of us have personally experienced the gradual integration of LED or Solid-State Lighting (SSL) into one aspect of our lives or another. From holiday lights to headlights to stoplights, very few have been able to overlook the advent of this promising technology and its effect on the world around us. While the first practical light-emitting diode was developed back in the 1960's, it was advancements made in materials science and the resulting development of the high efficiency white variety in the mid-1990's which finally unlocked its true potential as a viable light source and has led to its rapid and immense commercialization. But as quickly as it has progressed, this technology is still in its relative infancy with thousands of manufacturers around the world jockeying for position in what's become a crowded and somewhat noisy marketplace. With luminous efficacies today residing well below the theoretical limit of the light source, there is still a vast potential for LED lighting to exploit, as it stakes out its territory as the principal means of artificial lighting into the foreseeable future.

Traditional sports field lighting has been dominated by the use of the metal halide light source for decades. Tens of thousands of installations across North America have utilized 1000 or 1500 watt lamps housed in floodlights possessing varying degrees of optical control. While luminaires have become more sophisticated over time, the basic limitations inherent in High Intensity Discharge (HID) lighting, assured that any potential enhancements would remain incremental at best and the opportunity for any gains in efficiency, extremely remote. In essence, the grounds have for years been left fertile for a successor technology which could offer enhanced capabilities to lighting designers which have been woefully lacking for more than a generation.

Sports fields have always been and remain a very small slice of the artificial illumination pie, far exceeded by sales in the residential, commercial and industrial lighting segments. As such, the rush to develop new and innovative ways to serve this niche market has been literally non-existent. The low hanging fruit of consumer incandescent and compact fluorescent lamps, were the first to be harvested by LED followed by the progressively higher wattages utilized in interior and exterior area lighting applications. The laws of supply and demand will inevitably dictate the way this picture will continue to develop as costs fall across the entire LED lighting market due to fierce competition and ever increasing efficiencies, similar to the way the PC market evolved. Unfortunately for the end users of sports field lighting, this market does not possess the critical mass which will provide immediately and across the board all the benefits of a rapidly emerging technology along with the economically viable price point required to justify

increased expenditures. With more manufacturers entering the sports field lighting marketplace we have seen costs decline, however, the rate of decrease has predictably been much slower than that experienced in most other lighting sectors. While direct comparisons are not particularly useful as their design qualities are inherently different, a true LED sports floodlight can currently cost over three times as much as the traditional metal halide version.

The advantages of LED lighting over traditional metal halide lighting systems, and most existing lighting systems for that matter, are numerous. First and foremost of these is dramatically reduced power consumption. With the LED floodlights on the market today, we can typically illuminate any sports field utilizing approximately half the wattage historically required with metal halide luminaires. An over fifty

percent reduction in hydro consumption means that we can design new installations with less and smaller wiring along with equally smaller servicing, all of which results in a reduced capital expenditure for the client. Operating costs are significantly reduced along with electrical demand, an input whose cost is destined to continue to increase in a future of dwindling resources.

Although we would never consider any lighting system to be completely "maintenance-free," LED floodlighting could be about as close as you can get to the "set it and forget it" ideal. With some manufacturers guaranteeing operating life of over 200,000 hours without a noticeable decrease in light output, there is definitely no need to worry about group lamp replacements any longer and the associated costs of labour,

materials and lifting equipment. A deteriorating LED tends to present itself in terms of reduced light output as compared to the complete failure exhibited in a metal halide lamp. Spot repairs to replace defective drivers or modules should, in any case, be extremely limited but must still be a consideration as should some general cleaning of the optical chamber, even if only exercised over the course of a long term maintenance cycle.

LED lighting is "instant on" which means that there is no warm-up period involved as with a typical metal halide or HID luminaire. Any power interruption of whatever duration will not affect the ability of the LED floodlight to operate immediately and at full intensity upon the re-establishment of power. LED technology also possesses the comparatively basic ability to be dimmed. While this can be accommodated wirelessly on existing installations lacking the required wiring infrastructure, this feature can also be enabled relatively easily and at only a marginal cost on new installations. The ability to effortlessly, instantaneously and uniformly vary the lighting level to suit a particular class of play or event or to



provide theatrics once only reserved for the largest and most sophisticated of venues should not be discounted either as the ultimate control device or a basic energy saving feature.

The optical point source inherent in the LED chip also affords us much greater control of the light produced, something designers have only been able to achieve with high wattage metal halide luminaires by utilizing a rudimentary combination of bent metal shields, louvers and visors. Even then, the results have been less than ideal and the level of control sometimes required has been difficult or impossible to achieve. With green spaces at a premium and many new and existing sports field lighting installations encroaching upon residential properties, the control of unwanted spill light and glare has become ever more important in protecting the property rights of land owners as well as the environment. While all lighting installations remain bound by the same laws of physics, it is the use of proper design techniques uniquely tailored to the facility which remains the critical feature of any well planned sports field lighting project. Properly harnessed, the directional nature, colour temperature options and controllability of the LED light source can act as an important tool in providing unprecedented accuracy of the end result.

So how do we determine if LED is the best choice for our sports field lighting installation or renovation? Any decision to upgrade to LED lighting should be made on a case by case basis and typically by adhering to the results of simple cost/benefit analysis. One of the most crucial factors in reaching this determination is the hours of operation. Most municipal sports field lighting systems located within southern Ontario, operate for no more than 400 hours per year. When the cost premium to illuminate a senior soccer field can easily be \$100,000, this relatively limited utilization rate makes it terribly difficult to justify the expenditure based on reduced hydro consumption and maintenance costs alone. Simple payback periods of 50 to 60 years are not uncommon under these types of scenarios and can make the decision quite obvious for many cash-strapped user groups and municipalities. Facilities possessing artificial turf fields and those with air-supported structures can make a much more compelling economic case for LED by virtue of their increased operating hours which can extend well into the shoulder seasons for artificial turf fields alone. All season air-supported structures are especially capable of justifying the upgrade based on their year round operation and their need for artificial illumination during both the night and day. Many professional and semi-professional sporting venues which generate numerous revenue streams at their facilities and which are capable of reaping the benefits from the superior lighting for televised broadcasting which LED lighting provides, have already made the decision to upgrade or will soon do so. The wide range of control and colour options available create entertainment value for the spectator. The economic incentives for owners are quite strong with LED lighting retrofits currently being played out in stadiums across North America.

Proposed facilities where hydro servicing is severely

limited or its establishment cost prohibitive are typically good candidates for LED lighting. The overall reduced electrical loading can result in a decreased main service size and is capable of being the difference in avoiding the punitive demand charges levied by most local electrical utilities on large commercial and industrial customers. More difficult to quantify and analyze on a spreadsheet is the socially responsible decision made by some participants to reduce their carbon footprint and conserve energy in all aspects of their everyday activities. For those whose primary motivation is to be truly “green”, this type of perceived benefit will always outweigh the costs involved. Utilizing the most efficient form of electric lighting available nicely suits the needs of these individuals regardless of the fact that their overall expenditure may increase dramatically with little chance of achieving any significant return on investment.

After all of the hand wringing and analysis, however, the final decision of whether or not to utilize an LED lighting system will inevitably end up being wrested from the hands of any single individual or user group. Government legislation alone will eventually make this decision quite simple for everyone. In February of 2017, the U.S. Department of Energy enacted energy conservation standards which effectively prohibit the use of traditional 1000 watt metal halide ballasts and lamps in the manufacture of new luminaires (replacement parts, however, will remain available). While Canadian regulations have not yet been developed, the writing is clearly on the wall and it can be expected that similar directives will be passed here relatively soon. This type of legislation is similar to that approved just a few years ago which effectively removed the incandescent bulb from store shelves. While the 1500 watt metal halide lamp may initially receive a reprieve, it has numerous shortcomings as well in the design of sports field lighting, most notably its relatively short rated life, which must be taken into account in the overall decision making process.

The future of lighting is here. And unlike the evolution of the audio market which progressed from vinyl to 8-track, cassettes, CD's and finally to digital, this technological base is both stable and predetermined. The only stumbling block that remains is the development of a generic replacement parts standard as we have currently with most HID lighting systems, however, this debate will not be resolved anytime soon. This is why it is imperative that consumers buy from well-established manufacturers with history in the marketplace and warranties which can be trusted to be worth the paper they are written on. Exaggerated claims should always be vigorously challenged and all manufacturers must have performed and be willing to produce the results of their third-party photometric testing, in accordance with the standards and practices established by the Illuminating Engineering Society of North America (IESNA). While we live in an era when economically justifiable options appear to remain in the world of sports field lighting design, upon closer inspection, the choices are in fact quite limited. In the end, the decision to embrace LED lighting is not really a question of “Do we or don't we?” but rather “When?” •

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Turfgrass Seed Sources in Ontario

Turf Seeding Rates are available in Table 7—2 Turfgrass Species Characteristics and Uses in OMAFRA publication 845, *Integrated Pest Management for Turf*, available for download at omafra.gov.on.ca/english/crops/pub845/pub845.pdf.

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Kentucky bluegrass	America Appalachian Armada Blue Velvet Crest Evora	Explorer Granite Langara Mercury Touchdown Touche	Argyle Aviator Barduke Baron Barimpala Barrister Barvette BlackJack Blue Angel	Blue Coat Blue Devil Blue Note Cadet Corsair Courtyard Dauntless Everglade Gaelic	Hampton HGT Jumpstart Midnight Midnight II Prosperity Right Rubicon Rubix	Argyle Award Baron Brooklawn Diva Ginney Ginney II Guinness	KenBlue Midnight Newport Palouse Rockstar Shamrock Wildhorse
Texas/Kentucky bluegrass hybrid	Bandera	Spitfire	Fahrenheit 90	SPF 30		SPF 30	
Poa compressa	Canon	Reubens	Reubens			Canada Blue	
Poa supina	Supernova		Supranova				
Poa trivialis	Colt Darkhorse	Racehorse	Laser	Sun-Up	Winterlinks	Bartalon	
Fine fescue: Blue	Azay Blue		Little Big Horn	MX 86			
Fine fescue: Chewings	Silhouette Victory II	Windward	Jamestown IV Longfellow II	Shadow II		Bridgeport II Culumbra II	Shadow II
Fine fescue: Creeping Red	Boreal Garnet Jasper II	Mystic Shoreline	Boreal Crossbow Kent Lifine	Navigator II Seafire Slender Trapeze		Aberdeen Boreal	Epic Oracle
Fine fescue: Hard	Bornito	Spartan II	Bighorn GT Firefly Heron	Rhino Ridu Sword		Bighorn GT Reliant IV	Soil Guard
Fine fescue: Sheep	Azay		Quatro			Marco Polo	
Tall fescue	Crossfire 3 Farin	Mustang 4	Darlington Lexington Sitka	Tahoe II Talladega Thunderstruck		Marauder	
Tall fescue: Spreading/ Rhizomatous	Blade Runner II	Team Blend	RTF Rhizomatous			Falcon IV	Titan Ultra
Perennial ryegrass	Arctic Green Cutter II Dasher 3 GLSR Double 4N Edge II Express III Fiesta 3	Mighty Night sky Sunshine II Transist 2600 Intermediate TXR Annual Wicked	Amazing GS Home Run Palace Pillar Premium	Presidio Primary Prominent Provost		Arctic Green Dominator Doubletime Elegana	IQ Libero Manhattan 5 Palmer III
Perennial ryegrass: Creeping/Regenerating	Blazer 4 Fiesta 4 GLSR	Karma Sideways	RPR Regenerating			Baralpha	
Weeping alkali	Fults II	Salty	Fults	Fults II		Fults	
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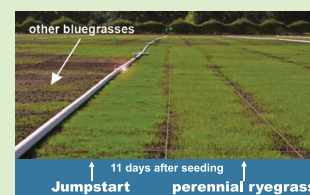
Poa pratensis

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With its quick germination and establishment, Jumpstart is great for sports turf use especially for overseeding existing turf areas between games on athletic fields. Jumpstart has good traffic tolerance because of its high density enabling quick recovery after traffic events. It can be seeded at 2-3lbs /1000sq. ft.(125kg/ha) during early fall or spring. Fertilize at 3-4lb N/1000sq.ft./year (170kg/ha).

Mean seed germination rates (%) for entries in a Kentucky bluegrass laboratory germination trial started 16 March 2007 using raw seed pre-chilled for seven days.

Entry	5 days	
	Raw	Pre-chilled
Jump Start	0	81
Midnight	0	52.3
Avalanche	0	50.5
Unique	0	50
Full Moon	0	49.5
LSD (0.05)	0	9.3



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Human Caused Global Warming – the Biggest Deception in History

Dr. Tim Ball

Business today is a balance between government and the real world.

Tim Ball

Global Warming is another undelivered government promise.

Tim Ball

Despite what you read on the Internet, I never received funding from any energy sector company. Almost all my limited funding came from the National Museum of Canada.

Nine years in the Canadian Air Force included four years flying over the Atlantic and five years with Arctic Search and Rescue created an interest in weather and climate. When my military contract was complete, I began a program in climatology that culminated in a Ph.D. from the University of London England.

When I began in the late 1960s, the consensus was that the world was cooling and would continue to cool. I opposed that consensus and the later global warming consensus. My research involved reconstructing past climate and that showed me how climate changes all the time and far more rapidly than most people realize. In an average 70-year lifespan, a person usually experiences at least three climate changes. For example, the world warmed from 1900 to 1940, cooled to 1980, warmed to 1999 and has cooled since. Welcome to the real, natural, world.

The government and media message is that the world is warmer today than at any time in the record. In fact, the 1930s were warmer than today. It was warmer for about 97 percent of the last 10,000 years, a period known as the Holocene Optimum. Figure 1 shows the temperature of the Northern Hemisphere derived from Greenland ice cores. The current temperature on the right years ago, marks the date obtained from a fossilized White Spruce located 100 km north of the current treeline (Figure 2).

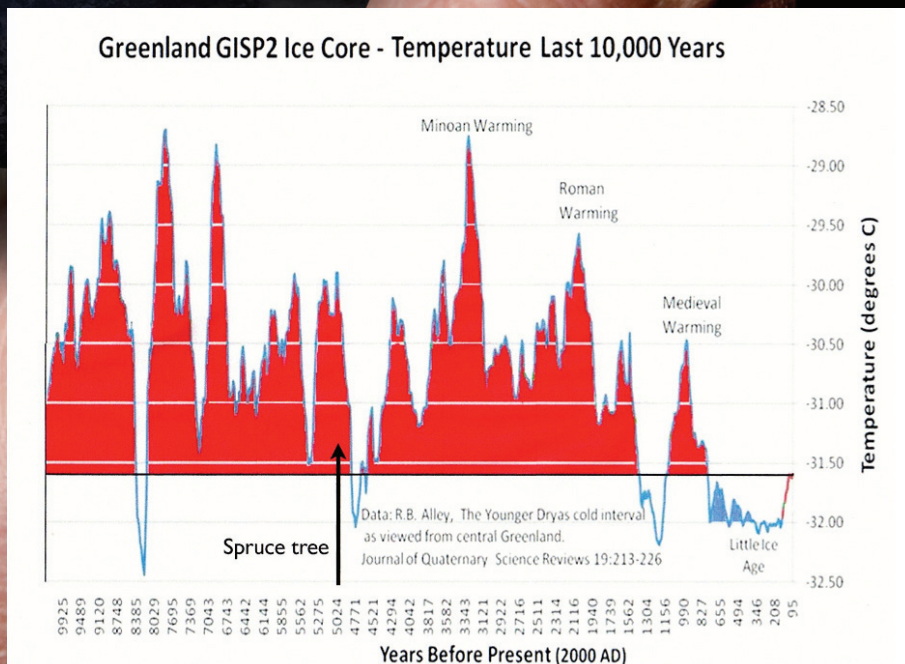


Figure 1



Figure 2

The tree, located 100 km north of the current tree line is radiocarbon dated at 4,940 years \pm 140 Before Present (BP). The growth rings are much wider than trees at the modern tree line and means temperatures were at least 2°C warmer than today. We are told that if the world becomes 2°C warmer than today, it faces disaster. How on earth did the polar bears survive?

We are also told that a major part of the pending disaster is a sea level rise. What they don't tell you is that sea level rose about 130 meters (426 feet) in approximately 5000 years during the Holocene and has hardly risen at all for the last 3000 years (Figure 3). Lower the sea level of British Columbia by 420 feet and imagine the change in the coastline; no need for B.C. Ferries.

President Obama kept saying that 97 of scientists agree, but that is yet another falsehood, deliberately created to perpetuate the deception. The researcher claimed that of 11,944 scientific papers 97.1% expressed an opinion supporting human caused climate change. In fact, by his definition only 41 agreed, or 0.3%.

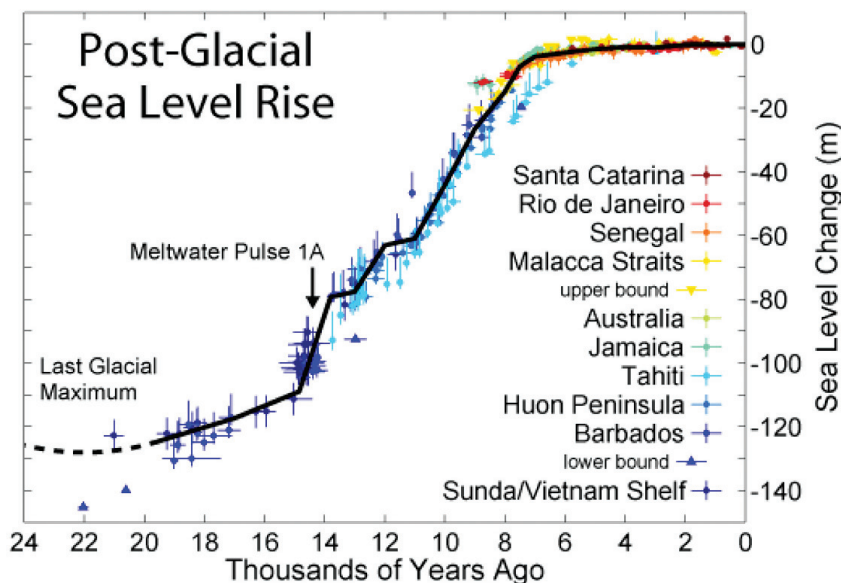


Figure 3

Misuse of statistics is common in the global warming deception. For example, CO₂ is only 4% of the total greenhouse gases, while water vapor (H₂O) is 95% and by far the most important. The public are told that a CO₂ increase causes a temperature increase, but that doesn't occur anywhere in nature. There, the temperature increases first. The only place where a CO₂ increase causes a temperature increase is in the computer climate models of the Intergovernmental Panel on Climate Change (IPCC). Therefore, it is no surprise that every prediction (they call projections) they have made since 1990 was wrong (Figure 4).

Few scientists have read the IPCC Reports, they accept the results believing other scientist wouldn't cheat. Emeritus Professor of Physics, the late Hal Lewis wrote in his October 2010 resignation letter to the American Physical Society (APS) over their support of the global warming science that:

"the global warming scam, with the (literally) trillions of dollars driving it, that has corrupted so many scientists, and has carried APS before it like a rogue wave. It is the greatest and most successful pseudoscientific fraud I have seen in my long life as a physicist."

German meteorologist and physicist Klaus-Eckart Puls had a similar experience as he explained.

"Ten years ago I simply parroted what the IPCC told us. One day I started checking the facts and data – first I started with a sense of doubt but then I became outraged when I discovered that much of what the IPCC and the media were telling us was sheer nonsense and was not even supported by any scientific facts and measurements. To this day I still feel shame that as a scientist I made presentations of their science without first checking it."

If your predictions are wrong, your science is wrong.

Research by Sherwood and Craig Idso on hundreds of different plants show the fertilizer effect of increased atmospheric CO₂. These are confirmed by empirical evidence from commercial greenhouses that pump in up to 2000 parts per million (ppm) CO₂ that increases yield by a factor of four and reduces moisture requirements of the plant. Current atmospheric levels are 400 ppm, so the plants are effectively malnourished.

Many other facts show the 'official' climate science is wrong. The question is what do people in business do; especially those whose industry is effectively weather dependent? The first thing is to be aware that the sun, the major mechanism that causes climate change is indicating a continued cooling at least until 2030.

Climate and specifically warming, only became newsworthy when it was used by a small group of people to push a political agenda against industrialization and development. Extreme bias of climate research was deliberately created through the Intergovernmental Panel on Climate Change (IPCC) to prove rather than disprove, the hypothesis that human CO₂ was causing runaway global warming. IPCC

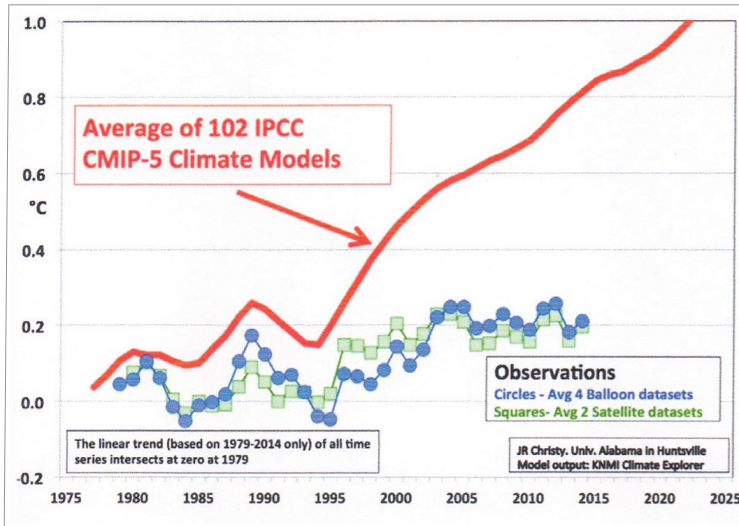


Figure 4

Five-year running mean temperatures predicted by the UN's climate models and observed lower atmospheric temperatures from weather balloons and satellites.

membership included only bureaucrats or their appointees from national weather offices (NWO) who comprised the World Meteorological Organization (WMO). Thus, NWOs controlled politicians and funding. A more detailed explanation is provided in my book *Human Caused Global Warming; The Biggest Deception in History*.

The government is planning for warming, but all the best evidence is the world is cooling. All you can do is be aware and prepare for cooler conditions. The adjustment to cooling is much more difficult and potentially limiting, so be prepared.

CO₂ is not a problem. It is not causing global warming or climate change, this is the biggest deception in history. To be more successful, business should determine the difference between reality and what the government demands. It is especially challenging when the government deliberately misleads. •

Figure 1 – After; Alley, R.B. (2000) *The Younger Dryas cold interval as viewed from central Greenland*. *Quaternary Science Reviews*, 19, 213-226

Figure 2 - Photo original by Professor J.C. Ritchie and reproduced by permission in H. H. Lamb's Volume 2 "Climate Past, Present and Future." Further written permission for reproduction obtained from Professor Ritchie to Tim Ball.

Figure 3 – en.wikipedia.org/wiki/File:Post-Glacial_Sea_Level.png

Figure 4 - science.house.gov/sites/republicans.science.house.gov/files/documents/HHRG-114-SY-WState-JChristy-20160202.pdf

Hal Lewis' October 2010 resignation letter – notrickszone.com/2012/05/09/the-belief-that-co2-can-regulate-climate-is-sheer-absurdity-says-prominent-german-meteorologist/#sthash.5LpKcJv0.dpbs

Klaus-Eckart Puls quote – wattsupwiththat.com/2010/10/16/hal-lewis-my-resignation-from-the-american-physical-society/

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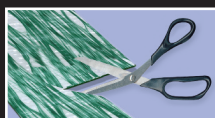
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Building a Strong Organization through Better Lines of Communication

Stan Kazymierchyk, Turfgrass Management Instructor at Kwantlen Polytechnic University, Surrey, British Columbia.

Culture is the character and personality of your organization – or the ‘soft’ side of management. It’s what makes your organization unique and is the sum of its values, traditions, beliefs, interactions, behaviors and attitudes. Building a solid workplace culture is thought to be a far better ROI for your business than instituting the ‘latest’ organizational process. Building your culture follows several simple steps:

- Identify your needs
- Brainstorm ways to achieve these needs
- Plan your attack
- Execute your plan
- Assess and refine periodically

Your culture should reflect expectations from your Mission Statement and Core Values. Leading by example is critical, as staff can mirror negative attitudes. Some of the behaviours and attitudes you may decide to cultivate are: Positivity, Clarification, Team-over-self, Ownership, Sociability, Involvement, Gratitude and Open-door Policy.

Leadership is an intangible most of us consider ourselves great at. Your labour force is your biggest expense and quickest route to greater efficiencies, leading to better quality turf. Refine and clearly define each jobs’ expectations. Bring in best staff by solid hiring, followed by comprehensive training, competency testing, consistent supervision and ethical staff guidance. Communicate hierarchy clearly and develop a ‘Supervisor Manual’ for your leaders – staff respect consistency.

Be organized and plan time for actions. Demanding responsible equipment care, without allocating adequate inspection or cleanup time soon leads to apathy. Establish what communication channels and with whom are essential to success, and follow them. Examples of this may involve leaders connecting with staff at least three times a day, keeping your bosses constantly updated and using social media group communication tools for leader communication. Exit interviews for departing staff may reveal deficiencies not previously shared.

Capital project and purchase success requires that you understand

the differences between what turf managers want, from what those with purchasing power want. You may be concerned with things like performance, comfort and serviceability of equipment, while upper managers only value things like cost, performance and liability. Recognizing that you are about to embark on a political campaign, formulate a ‘Sales Process’ that works for your site. For example:

- Identify who has purchasing power and what their needs are
- Identify and recruit those who can influence purchasers
- Guide your committee to research needs and narrow potential solutions
- Compose a sales plan, inform and build trust in your work

Dealers are essential allies of turf managers. They do much more than just sell you equipment and supplies. You don’t have time to constantly be on the road visiting your peers, but they do. They can keep you in touch with who is doing what and why. Cultivate relationships with them based on trust and honesty. It is surprising how business relationships share common personal interests.

Always ask first if they are busy before connecting and be patient if they don’t respond immediately – you are not their only customer. Remember that favours go both ways. Visit their shop, know their stock and understand how their business works. Keep them ‘in the loop’ early when problems occur. Texting pictures of issues to them saves everyone valuable time. Keep meticulous maintenance records, and use OEM parts if directed, and know specs and part numbers. They can only help you with warranty issues if you are diligent and straight-up. When requiring a specific piece of equipment, work with your dealer to specify in such detail that your purchaser cannot sub in a less expensive unit. Ask for demos and be adaptable to try demos of products when available.

Motivation of self and staff is critical to success. First recognize and control ‘frustration factors’ such as poor resources, expectations, politics and support. Minimizing these barriers can suddenly free us to better productivity.

Figure out the attributes that turn individuals on such as: Perfectionist; Control; Respect; Thrill of Pressure; Lack of

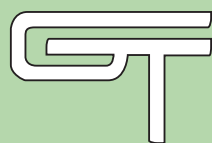
Pressure; New Challenges; Monotony; Recognition; Involvement; Creativity; Giving Back; Camaraderie; Sharing; Knowledge; and Security. People are usually most happy to discuss themselves, so a simple invitation to a private free meal should supply you with this valuable information on what really makes your biggest expense item tick. Note your findings, implement trial changes and schedule periodic 'progress checks'. Try to tailor your worksite's needs to individual's needs. When recruiting, consider what type of roles would be most valuable to your operation, not just skills and experience. Be sure you and your managers' needs are also met.

Public speaking is known as the most common fear, but essential to your role as a manager. Treat every speech as important, as it will hone your preparation skills. Nothing beats nerves like solid preparation. If your memory tends to 'blank out' easily, make up simple point form reminder notes in BIG PRINT. Simply listing the topics you wish to cover in sequential order is enough to keep you confidently on track if you really know your subject. Note how much time you can afford to spend on each topic, especially if you tend to ramble. If topics require specific emphasis or emotion, note this as well. Dress for comfort, be nicely groomed and have water handy for your voice. Arrive early to plan your positioning, feel the room and get comfortable with acoustics. Your voice should reach everyone in room.

Think of ways to get your message across indirectly. Understand your topic and really sell it to your audience. Add topical issues to help connect you closer with your audience. Practice speaking on your home turf, in front of people you know and are comfortable with and tag team early practice talks. Join 'Toastmaster' for another non-threatening learning experience or just watch others speak. My favourites are TV evangelists!

During your talk, you should be nervous when beginning, this is normal. Take a few deep breaths – simply focusing on inhaling and exhaling slowly. Connect with the eyes of a few smiling faces and reconnect with these same eyes often, as they will make you smile back and relax. Using your hands and moving about can diffuse stress more than a rigid lock on the podium. Acting concepts out brings levity and smiles. Vary your voice volume, tone and pace. Pauses, slowing down and lowering volume can all induce dramatic emphasis on critical points.

Using some or all of these techniques, you will be able to build better lines of communication in your organization, making it stronger and ultimately more profitable. •



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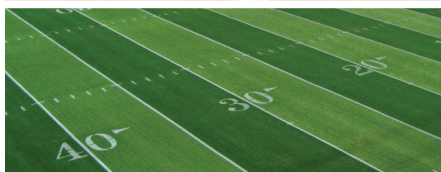
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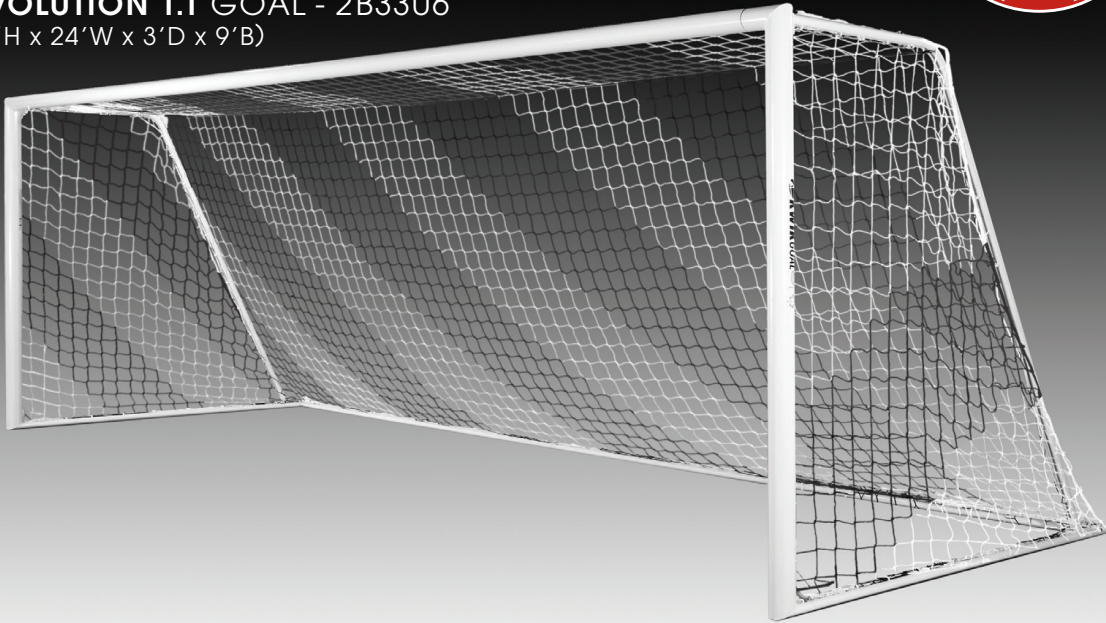
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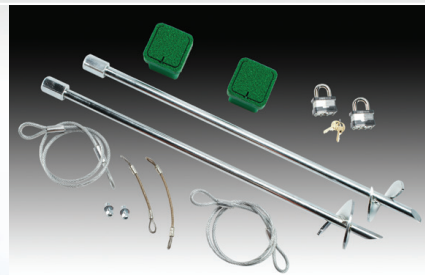
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