



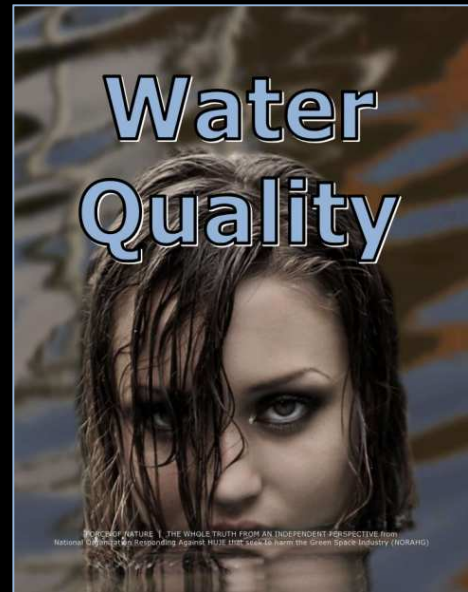
FORCE OF NATURE | THE WHOLE TRUTH FROM AN INDEPENDENT PERSPECTIVE from
National Organization Responding Against HUJE that seek to harm the Green Space Industry (NORAHG)

Hollow-tine cultivation can help reduce the loss of applied pest control products and fertilizers.

Research at the Agricultural Research Service Soil and Water Management Research Unit in Saint Paul, Minnesota, indicates that there are management practices that can be used as a preventive measure to protect water resources around a golf facility.

63 days after turfgrass cultivation and within 39 hours of an application of pest control product, scientists measured a 10 per cent reduction in RUN-OFF volume and a 15 to 24 per cent reduction in pesticide transport in RUN-OFF from plots receiving hollow-tine cultivation compared to those receiving solid-tine cultivation.

Hollow-tine cultivation reduced surface-water concentrations of pest control products to levels below those that are harmful to sensitive aquatic organisms.



Update



Golf Course Pesticide Run-Off

October 1st, 2012

United States Department of Agriculture

Media Release

Selected and Adapted Excerpts

Update



Golf Course Pesticide Run-Off

Introduction

At last count, around 27 million golfers in the United States have been teeing up for rounds on approximately 16,000 golf courses.

Each golf course has either 9 or 18 holes, so well over 100,000 fairways — which typically make up a third of a golf course — are carefully tended and pampered.

Golf courses are often close to ponds, streams, and lakes, and the chemicals used to maintain the grounds have been found in surface waters of urban water-sheds.

Now, studies by Agricultural Research Service chemist Pamela Rice on pesticide and nutrient losses from fairways have given landscape crews some environmentally-friendly ideas for maintaining the popular green playgrounds.

Pamela Rice works at the Agricultural Research Service (ARS) Soil and Water Management Research Unit in Saint Paul, Minnesota.

According to Pamela Rice —

Our research indicates that there are management practices you can use as a preventative measure to protect water resources around golf courses.

Update



Golf Course Pesticide Run-Off

Cultivation Method Affects Pesticide Fate

Pamela Rice worked with University of Minnesota professor Brian Horgan to design a series of studies at the University of Minnesota Turf Research, Outreach, and Education Center in Saint Paul.

One project simply measured the quantity of pesticides in RUN-OFF from creeping bentgrass (*Agrostis palustris*) turf managed as a golf course fairway.

The scientists applied the pesticides chlorpyrifos, flutolanil, mecoprop-p, 2,4-D, and dicamba to the experimental fairways and then measured the amount of the pesticides in RUN-OFF from simulated rain events that occurred within 33 hours of the applications.

Samples taken from edge-of-plot RUN-OFF contained less than 1 to 23 per cent of the total amount of pesticides applied.

With the exception of chlorpyrifos, all the other chemicals were detected in the initial RUN-OFF samples and in samples taken throughout the RUN-OFF events.

Rice and Horgan also evaluated the effects of different types of core cultivation on pesticide concentrations in RUN-OFF.

In HOLLOW-TINE CULTIVATION, soil cores are removed from the turf, air dried, and then brushed back into the open holes.

Update



Golf Course Pesticide Run-Off

Cultivation Method Affects Pesticide Fate (continued)

SOLID-TINE CULTIVATION uses less labor and is less disruptive to the turf surface, but can cause soil compaction.

Core cultivation on golf fairways controls thatch, alleviates surface compaction, improves water infiltration, and stimulates root and shoot growth.

Studying the same group of pesticides 63 DAYS AFTER THE PLOTS WERE CULTIVATED AND WITHIN 39 HOURS OF CHEMICAL APPLICATION, the scientists measured a 10 PER CENT REDUCTION IN RUN-OFF VOLUME and a 15 TO 24 PER CENT REDUCTION IN PESTICIDE TRANSPORT in RUN-OFF from plots receiving HOLLOW-TINE CULTIVATION compared to those receiving SOLID-TINE CULTIVATION.

Samples taken 2 DAYS AFTER THE PLOTS WERE CULTIVATED A SECOND TIME AND WITHIN 39 HOURS OF A SUBSEQUENT CHEMICAL APPLICATION showed a 55 PER CENT REDUCTION IN RUN-OFF VOLUME and a 35 TO 57 PER CENT REDUCTION IN PESTICIDE TRANSPORT.

Rice and Horgan calculated the environmental concentrations of these pesticides in surface water receiving RUN-OFF from turf managed with SOLID-TINE CULTIVATION and found that they would EXCEED LEVELS THAT ARE HARMFUL TO NINE SENSITIVE AQUATIC ORGANISMS.

But HOLLOW-TINE CULTIVATION REDUCED SURFACE-WATER CONCENTRATIONS OF THE PESTICIDES TO LEVELS BELOW THESE FOR MOST OF THESE AQUATIC FAUNA.

Update



Golf Course Pesticide Run-Off

Computer Models — Room for Improvement

Along with ARS agricultural engineer Kevin King, who works at the ARS Soil Drainage Research Unit in Columbus, Ohio, the researchers used the data they collected to evaluate a turfgrass RUN-OFF MODEL called « *TurfPQ* ».

This model estimates pesticide levels in RUN-OFF associated with moderate rainfall, and they wanted to see how accurately TurfPQ predicted pesticide transport in RUN-OFF associated with more intense rainfall.

They compared RUN-OFF data from 13 artificial rainfall events to estimates provided by TurfPQ for the same conditions.

The scientists found that the model's estimates were lower than the actual measurements for transport of dicamba, 2,4-D, flutolanil, and chlorpyrifos.

The model predicted that RUN-OFF would begin later than it actually did, which in turn increased error estimates for the amount of pesticides available for offsite transport via RUN-OFF.

As a result of these findings, they concluded that with some tweaking, TurfPQ could provide better pesticide-loss estimates during intense storm events.

Update



Golf Course Pesticide Run-Off

What About Fertilizers ?

Rice and Horgan also used their experimental plots to study differences between how HOLLOW-TINE CULTIVATION and SOLID-TINE CULTIVATION affected nitrogen and phosphorus retention on fertilized fairways.

In surface waters, these two nutrients feed the growth of algae, and when the algae die, their decomposition depletes oxygen levels in the water.

These conditions contribute to deterioration of local water-ways and downstream aquatic environments.

The U.S. Environmental Protection Agency (EPA) has established phosphorus limits for lakes and streams and nitrate nitrogen limits for our drinking water.

Using the same experimental turfgrass fairways that were used for the pesticide studies, the researchers measured RUN-OFF volume and amounts of soluble phosphorus, ammonium nitrogen, and nitrate nitrogen that were lost via RUN-OFF.

As with their pesticide studies, Rice and Horgan found LOWER NUTRIENT CONCENTRATIONS IN RUN-OFF from fairway plots that received HOLLOW-TINE CULTIVATION compared to SOLID-TINE CULTIVATION — UP TO 77 PER CENT LESS 2 days after the plots were cultivated and up to 27 PER CENT LOWER 63 days after cultivation.

They also estimated the environmental concentrations of nitrogen and phosphorus in surface water receiving RUN-OFF from the experimental plots.

Update



Golf Course Pesticide Run-Off

What About Fertilizers ? (continued)

They found that with one exception, phosphorus concentrations usually remained above EPA water-quality criteria established to limit eutrophication, which can occur when water bodies receive excess nutrients that stimulate excessive plant growth.

(The exception was observed in phosphorus concentrations found in RUN-OFF 2 days after HOLLOW-TINE CULTIVATION.)

However, all estimated environmental concentrations of NITROGEN were BELOW LEVELS ASSOCIATED WITH INCREASED ALGAL GROWTH, and NITRATE LEVELS IN RUN-OFF FROM PLOTS RECEIVING EITHER TYPE OF CORE CULTIVATION WERE NOT HIGH ENOUGH TO THREATEN HUMAN HEALTH.

According to Pamela Rice —

We've seen that the total amount of applied chemicals lost from golf courses is more a function of the volume of RUN-OFF than the concentrations of chemicals in the RUN-OFF.

Our studies also show that, even though it is more labor intensive, HOLLOW-TINE CULTIVATION CAN HELP REDUCE THE LOSS OF APPLIED NUTRIENTS AND PESTICIDES FROM FAIRWAYS, which helps protect nearby surface waters.



Core cultivation of plots. Some plots were cultivated with solid tines, others with hollow tines. RUN-OFF was collected from plots cultivated by each method and analyzed for pesticide and fertilizer (nitrogen and phosphorus) content.



Pesticides being applied to experimental turf plots maintained at a golf course fairway. Following a simulated rain event, RUN-OFF was collected from the plots and analyzed for five different pesticides.



At the University of Minnesota Turf Research, Outreach, and Education Center in Saint Paul, Minnesota, a rainfall simulator is used to generate RUN-OFF. Plots were equipped with rain gauges and automated RUN-OFF samplers to measure precipitation, RUN-OFF, and flow rates, and to collect periodic RUN-OFF samples.

NORAHG

We are living in the 9|11 Era of Anti Pesticide Terrorism where at least ONE SUBVERSIVE ACT OF TERROR is Perpetrated EVERY SINGLE DAY by enviro lunatics.

We are living in the DARK AGE OF ANTI PESTICIDE TERRORISM where sound science is trumped by FAKE SCIENTISTS, JUNK SCIENCE and UNVERIFIABLE SECRET EVIDENCE through FABRICATION, INNUENDO, and INTERNET RUMOUR — scientific research PROVES that pest control products CAUSE NO HARM and can be USED SAFELY.

NORAHG is the National Organization Responding Against HUJE that seek to harm the Green space industry.

NORAHG morally represents the VAST SILENT MAJORITY of people in the Green Space Industry who are OPPOSED to Anti Pesticide PROHIBITION.

NORAHG is a NATIONAL NON PROFIT NON PARTISAN organization that does not accept money from corporations or governments or trade associations, and represents NO VESTED INTERESTS WHATSOEVER.

NORAHG is dedicated to reporting the work of RESPECTED and HIGHLY RATED EXPERTS who promote ENVIRONMENTAL REALISM and PESTICIDE TRUTHS.

Anti Pesticide HUJE are enviro lunatics and lawn haters who particularly DESPISE the golf industry — they are Hateful Underhanded Jokes as Environmentalists who have been WRONG FOR OVER 50 YEARS.

There is NO RECOURSE but LITIGATION against these HUJE, as well as CANCELLATION of GOVERNMENT GRANTS and REVOCATION of the TAX EXEMPT STATUS of their organizations. HUJE should Get OFF Our grASS, and they should Roast In Hell.

Anti Pesticide HUJE are advised that all names, statements, activities, and affiliations have been ARCHIVED for eventual CRIMINAL CHARGES.

NORAHG manages The Library of Force Of Nature Reports and References for all Anti Pesticide Terrorist Acts of Subversion.

The NORAHG of Library Force Of Nature Reports and References is a VAST ARCHIVE of DOCUMENTS, AUDIO CLIPS, and VIDEOS on ALL Anti Pesticide Activities has been made AVAILABLE through NORAHG to anyone interested in LITIGATION.

These ARCHIVES contain names, statements, activities, and affiliations of ALL anti pesticide vermin, including government officials, as well as charitable prohibition terrorist organizations that DO NOT DESERVE ANY tax exempt status.

Interested parties need only to send NORAHG their REQUESTS for ANY INFORMATION needed in the War Against Lunatic Terrorist PROHIBITION.

NORAHG also produces FORCE OF NATURE, reports that present THE WHOLE TRUTH FROM AN INDEPENDENT PERSPECTIVE about environmental issues, including anti pesticide terrorism.

FORCE OF NATURE is a series of reports destined for the green space industry, the environmental terrorist movement, governments, and the media, nationwide across Canada, the United States, and overseas.

FORCE OF NATURE is committed to SOUND SCIENCE, as well as ground breaking original reporting that informs, entertains, and creates real change.

The Force Of Nature Series of Reports — Agriculture • ALBERTA Conspiracy • Bee Colony Collapse Disorder • Bee Colony Collapse Disorder • Benefits of the Turfgrass Industry • Beyond Pesticides • Books That Screwed Up the World • BRITISH COLUMBIA Conspiracy • Canadian Cancer Society • Canadian Association of Physicians for the Environment • CARNAGE and Consequences of Lunatic Terrorist Prohibition • Controversial Prohibitions • Culprits of the Prohibition Conspiracy • Daffodils, Toxic Pesticide Treated Flowers Soaked Formaldehyde • Dating Services for Enviro Maniacs • David Suzuki Foundation • DDT and Our World of Politicized Science • Death and Illness (Alleged) • Departure Letters • Ecojustice Canada • Energy Sector • Environmental Terrorists UNMASKED • Environmental Terrorist Organizations • Enviro PROFIT • Environmental Defence • FAILURE of IPM, Pesticide Manufacturers, Prohibition, Trade Associations • Famous Quotations About Enviro Lunatics • Fertilizer TERROR • Food and Farming • Get Off Our grASS • Global Warming, The Scam of Our Lifetime • Glyphosate Herbicide • Golf Industry • Green Alternatives • Green Party • Halloween Terror • Happy Holidays • Health Canada • Health Concerns with Pest Control Products • Heroes Speaking Out Against Environmental Terror • History of Environmental Terror in Canada • History of the Turfgrass Industry • Letters to the Editor • LIARS and Lying Sacks of (Enviro Maniac) Cwap • Mock Advertisements • Mock Speeches • Myth BUSTING • NATIONAL Prohibition • NEW BRUNSWICK Conspiracy • NO Prohibition Exception for AGRICULTURE Industry • NO Prohibition Exception for GOLF Industry • NOVA SCOTIA Conspiracy • North America Free Trade Agreement (NAFTA) • ONTARIO Conspiracy, Haven For Environmental Terrorists • Ontario College of Family Physicians • Organic Golf Courses • Organic Maintenance • Organizations of the Prohibition Conspiracy • Pesticide Q & A (Questions and Answers) • Positive Waves (Interesting and Innovative Thinking) • PRINCE EDWARD ISLAND (PEI) Conspiracy • QUEBEC Prohibition • Quotations About Enviro Lunatics & Maniacs • Rachel Carson, The Queen of Junk Science • SASKATCHE-

The Whole Truth from an Independent Perspective

NORAHG

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The information presented in FORCE OF NATURE has been developed for the education and entertainment of the reader by providing a sequence of events WITH COMMENTARY, striving for accuracy in history, politics, and science.

FORCE OF NATURE is TOTALLY INDEPENDENT and provides NO guarantee regarding accuracy or completeness. In no event shall FORCE OF NATURE be liable for any incidental or consequential damages, lost profits, or any indirect damages.

NORAHG also produces A LOOK AT, a series of reports providing TECHNICAL INFORMATION on issues such as Career Management, Golf Course Maintenance, Green Alternatives, Summer Stress, Turfgrass Pests, and Turfgrass Species.

Finally, NORAHG frequently responds to anti pesticide activists in LETTERS TO THE EDITOR in newspapers across Canada and around the world.

All information, excerpts, and pictures contained in FORCE OF NATURE, A LOOK AT, and LETTERS TO THE EDITOR were retrieved from the Internet, and may be considered in the public domain.

FORCE OF NATURE, A LOOK AT, and their various incarnations, was the brainchild of William H. Gathercole and his colleagues in 1991. Mr. Gathercole is now retired, although his name continues to appear as founder.

Here is a brief summary of Mr. Gathercole's career —

Fields of study — Horticulture/Agriculture, Mathematics, Physics

Alma mater — McGill University • University of Guelph • the first person ever to obtain university degrees and contribute to both the professional lawn care and golf maintenance industries

Expertise in — environmental issues and anti pesticide terrorism • turf and ornamental maintenance and troubleshooting • history of the industry • sales and distribution of seeds, chemicals, fertilizers, and equipment • fertilizer manufacturing and distribution

Notable activities — worked in virtually all aspects of the green space industry, including golf, professional lawn care, distribution, environmental compliance, government negotiations, public affairs, and workplace safety • supervisor, consultant, and, programmer for the successful execution of hundreds of thousands of management operations in the golf and urban landscape, as well as millions of pest control applications • advisor, instructor, and trainer for thousands of turf and ornamental managers and technicians • pesticide certification instructor for thousands of industry workers • founder of the modern professional lawn care industry • prolific writer for industry publications and e-newsletters • first to confirm the invasion of European Chafer insect in both the Montreal region and the Vancouver / Fraser Valley region • with Dr. Peter Dernoeden, confirmed the presence of Take All Patch as a disease of turf in Eastern Canada • with Dr. David Shetlar, confirmed the presence of Kentucky Bluegrass Scale as an insect pest in South Western Ontario, and later, in the Montreal and Vancouver regions

Special contributions — creator of the exception status that has allowed the golf industry to avoid being subjected to anti pesticide prohibition • creator of the signs that are now used for posting after application • co-founder of annual winter convention for Quebec golf course superintendents • the major influence in the decision by Canadian Cancer Society to stop selling for profit pesticide treated daffodils • the only true reliable witness of the events of anti pesticide prohibition in the town of Hudson, Quebec • retired founder of FORCE OF NATURE and A LOOK AT reports

Notable award — the very first man of the year for contributions leading to the successful founding of Quebec professional lawn care industry, which served as a beach-head against anti pesticide activists in the 1980s and 1990s

Legacy — Mr. Gathercole and his colleagues ... designed and implemented strategies that reined anti pesticide activists to provide peace and prosperity for the entire modern green space industry across Canada • orchestrated legal action against anti pesticide activists in the town of Hudson, Quebec • launched the largest founding professional lawn care business in Canada • quadrupled the business revenues of one of the largest suppliers in Canada

Mr. Gathercole is now retired, although his name continues to appear as founder of FORCE OF NATURE and A LOOK AT reports.

When turfgrass is properly maintained ...

Pesticides used in the Urban Landscape DO NOT enter our lakes and rivers



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